MYCOLOGIA

VOL. XIV JULY, 1922 No. 4

CONTRIBUTIONS TO OUR KNOWLEDGE OF OREGON FUNGI—I

S. M. ZELLER

(WITH 6 FIGURES IN THE TEXT)

The literature dealing with the fungous flora of Oregon has been almost entirely limited to papers on parasitic fungi. Before it is possible to list accurately the fungi of such a relatively unexplored region a great amount of labor is necessary in the preservation of specimens with accurate notes and labels. It is the purpose of the writer to preserve specimens of Oregon fungi as opportunity is afforded and publish from time to time those lists and notes of species which have never been reported from the state or concerning which notes of interest have been obtained. This is the first installment of such lists. In certain groups of fungi many of the determinations were either made or verified by specialists.

Many of the ascomycetous forms were sent to Dr. Fred J. Seaver for identification, or the Oregon specimens were compared with those sent to Dr. Seaver from Seattle, Washington, several years ago. Dr. E. A. Burt has kindly identified most of the Thelephoraceae and many of the polypores. Dr. J. R. Weir and Dr. L. O. Overholts have aided in the determination of some of the polypores, and Dr. C. H. Kauffman and Dr. W. A. Murrill in the determination of some of the Agaricaceae. Many fungi of all groups have been sent to Dr. C. G. Lloyd for comparison. The aid of these men has been greatly appreciated.

The list as given here is in the order of groups and families as given in Saccardo's "Sylloge Fungorum," and colors are given

[MYCOLOGIA for May (14: 99–172) was issued June 6, 1922]

according to the nomenclature established by Ridgway in "Color Standards and Color Nomenclature."

PHYCOMYCETES

1. Family CHYTRIDIACEAE

1. *Urophlyctis pluriannulatus* (B. & C.) Farlow.
   In leaves of *Sanicula Menziesii*, west of Corvallis. June. Not infrequent. No. 1825.

ASCOMYCETES

1. Family PERISPORIACEAE

2. *Meliola abietis* (Cooke) Sacc.
   This black leaf spot of *Abies grandis* was collected south of Corvallis. August. Infrequent. No. 1850.

2. Family SPHAERIACEAE

3. *Xylaria Longiana* Rehm.
   On oak. Corvallis. April. Infrequent. No. 2001.
4. *Daldinia vernicosa* (Schw.) E. & E.
   On burned-out trunk of *Quercus Garyana*, Corvallis. April. Rare. No. 2003.
5. *Hypoxylon atropunctatum* (Schw.) E. & E.
   On bark of *Quercus Garyana*. Corvallis. April. Common. No. 2000.
6. *Gnomonia Coryli* (Batsch) E. & E.
   On lower surface of leaves of *Corylus Californica*. Corvallis. June. Frequent. No. 2013.
7. *Lasiosphaeria strigosa* (A. & S.) E. & E.
   On decayed *Alnus* stub, west of Alsea. August. Infrequent. No. 1963.

3. Family HYPOCREACEAE

8. *Nectria episphaeria* (Tode) Fries.
   On *Diatrype* on hazel, Corvallis. May. Frequent. Nos. 1953, 1954, 1956.
9. *Nectria Coryli* Fuckel.
   On *Salix*, Corvallis. Infrequent. No. 1939. Collected and determined by H. P. Barss.
10. *Nectria galligena* Bres.
    Commonly found causing a canker on several varieties of apple and pear and one variety of quince. It has been identified on one native host, *Acer macrophyllum*. This species has been collected in many localities west of the Cascade Mountains. Nos. 1804, 1820, 1823, 1895, 2097, 2098, 2099, 2101, 2103, 2104, 2106–2112, 2174, 2175, 2213.
11. *Nectria coccinea* (Pers.) Fries.
    This *Nectria* which resembles *N. galligena* in gross morphology is dis-

tinguished by the character and size of the spores and structure of the perithecium. *Nectria coccinea* has been collected in the vicinity of Corvallis on *Quercus Garyana, Acer circinnatum, Cornus Nuttallii* and *Salix* sp. Nos. 1803, 1938, 2095, 2100.

12. *Pleonectria berolinensis* Sacc.
On old canes of *Ribes*, Corvallis. April. Rare. No. 1925.

4. Family BULGARIACEAE

13. *Stamnaria Persoonii* (Moug.) Fuckel.
On *Equisetum*, Roseburg. Collected by F. H. Lathrop. October. Rare. No. 2031.
Although usually reported as saprophytic it seems to be parasitic in this case.

14. *Bulgaria inquinans* (Pers.) Fries.
On decayed wood, Corvallis. November. Frequent. No. 1980.

5. Family HELOTIACEAE

15. *Phialea alniella* (Nyl.) Sacc.
This little white, stalked discomycete is very common in the spring and makes a striking appearance as it covers the old female cones of *Alnus* which have dropped to the ground.

6. Family PEZIZACEAE

16. *Otidea leporina* (Batsch) Fuckel.
In coniferous woods, Corvallis and Aurora. November. Frequent. Nos. 1874, 2192.

17. *Aleuria aurantia* (Pers.) Fuckel.
Common in lawns and on campus of Oregon Agricultural College, Corvallis. Spring and fall until a freeze. No. 2210.

18. *Geopyxis cupularis* (L.) Sacc.
On ground where brush had been burned. South of Corvallis. April. Frequent.

19. *Discina ancilis* (Pers.) Sacc.
On ground in peach orchards, Kiger Island. April. No. 1910. A very common spring form in the humid portions of the Northwest.

20. *Pseudoplectania melaena* (Fries) Sacc.
On decaying vegetation in mixed forests, on the hills northwest of Corvallis and on Mary's Peak. March and June. Infrequent. No. 2090.

21. *Sarcoscypha coccinea* (Scop.) Sacc.
On decayed coniferous twig, Corvallis. February. Rare. No. 1892.

7. Family HELVELLACEAE

22. *Morchella angusticeps* Peck.
In prune orchard, Kiger Island. April. Frequent. No. 1926.

23. *Morchella crassipes* (Vent.) Pers.
On ground in old orchard, Philomath. April. Infrequent. No. 1924.

24. *Morchella deliciosa* Fries.
On ground in prune orchard, Corvallis. April. Infrequent. No. 1913.

25. *Morchella semilibera* DC.

On ground in prune orchard, Corvallis. April. Infrequent. Nos. 1914, 1916.

26. *Helvella crispa* Fries.

In mixed woods, Corvallis. November. Infrequent. No. 2202.

27. *Helvella elastica* Bull.

On ground in coniferous forest, Corvallis. April. Infrequent. No. 1998.

28. *Helvella lacunosa* Afzel.

On ground in coniferous forest, Corvallis and Mary's Peak. April. No. 1764.

This is the most common species of this order to be found in western Oregon. It appears most profusely in the autumn.

29. *Helvella infula* Schaeff.

On old log of *Pseudotsuga taxifolia*, on the east side of Alsea Mountain. November. Not infrequent. Nos. 1798, 2196.

30. *Gyromitra esculenta* (Pers.) Fries.

Elgin, Union County. April to May. No. 2094.

31. *Spathularia clavata* (Schaeff.) Sacc.

Very plentiful on ground in coniferous woods, Mary's Peak. November. No. 1876.

32. *Trichoglossum hirsutum* (Pers.) Boudier.

In humus in open grassy woodlot north of Corvallis. April. Infrequent. No. 2004.

This collection has uniformly 15-septate spores. The plants are black, 8–10 cm. high and solitary or gregarious.

8. Family TUBERACEAE

33. *Hydnotrya ellipsospora* Gilkey.

Under leaves of *Quercus* and *Pseudotsuga*, Corvallis. March. Rare. No. 1901.

34. *Tuber candidum* Harkness.

On diggings of wood rat under oaks, on campus of McMinnville College, McMinnville. December. This collection (No. 2164) was taken by the writer and identified by Dr. Helen M. Gilkey. This is the most common *Tuber* collected in California within the limited area of Alameda and Placer Counties which hitherto has been its known limits of distribution. This is the first report of the species from Oregon.

BASIDIOMYCETES

1. Family UREDINACEAE

35. *Puccinia Burnettii* Griff.

On *Sidalcea*, Linn County, east of Corvallis. July. No. 2243.

36. *Puccinia gigantispora* Bubak.

On *Anemone*, Mary's Peak. August. No. 2265.

37. *Puccinia Lapsanae* Fuckel.

On *Lapsana communis*, Corvallis. August. No. 2245.

38. *Polythelis thalictri* (Cher.) Arthur.
On *Thalictrum occidentale*, Corvallis. August. No. 2246.

2. Family USTILAGINACEAE

39. *Schizonella melanogrammia* (DC.) Schroet.
On *Carex*, Linn County, east of Corvallis. August. No. 2247.

3. Family TREMELLACEAE

40. *Gyrocephalus rufus* Bref.
On humus in coniferous woods, Corvallis. October. Common. No. 2038.

41. *Tremella frondosa* Fries.
On oak stump, Corvallis. Infrequent. October to November. Nos. 2051, 2190.

42. *Tremella lutescens* Pers.
On stumps and fallen dead wood, Corvallis. Frequent. October to November.

43. *Tremella mesenterica* Retz.
On oak stump, Corvallis. Infrequent. May. No. 1958.

44. *Naematelia encephala* (Willd.) Fries.
On *Pseudotsuga* and *Abies*, Corvallis. February. Frequent. Nos. 1894, 1901. This western variety is much larger than typical *N. encephala* and the core is pure white.

45. *Exidia recisa* Fries.
On dead bark of apple and other deciduous trees, Corvallis. November. Infrequent. No. 1968. This species has a translucent wine color and shades of brown.

46. *Exidia Zelleri* Lloyd.[1]
On *Sambucus glaucus*, Corvallis. October. Infrequent. No. 1775. "Plants applanate to gyrose, about 1 mm. thick, surface even; color when fresh pale purplish-gray, subtranslucent with faint violaceous cast, drying darker. Papillae very few, scattered, globose. Basidia globose, hyaline, 12–14 μ, imbedded in a thin layer, close to surface. Spores 6 x 20 μ, hyaline, curved or rarely straight."—Lloyd. This plant is very close to *Tremella violacea*, according to Lloyd, but differs in size, size and shape of spores, and in the fact that the basidia are embedded in a very thin layer.

47. *Dacryomyces aurantia* Schw.
On fir stumps, Corvallis. May. Infrequent. No. 1957.

2. Family CLAVARIACEAE

48. *Sparassis radicata* Weir.
Parasitic on roots of Douglas fir, Philomath. November. Rather frequent. No. 2163.

49. *Clavaria pistillaris* Fries.
On the ground in mixed woods, Mary's Peak, Tidewater and Corvallis. December to June. Frequent. Nos. 1726, 1967.

[1] Lloyd, C. G. Mycological Notes **62**: 931. 1920.

50. *Clavaria corniculata* Fries.

On ground under *Pseudotsuga taxifolia*, near Corvallis. December. Frequent. No. 1972.

51. *Clavaria mucida* Pers.

On rotten oak log, Corvallis. December. Infrequent. No. 1971.

52. *Clavaria cristata* Fries.

On the ground in mixed woods. This is the most common white *Clavaria* in the woods about Corvallis. It appears after the rains start in the fall and can be found until the early spring. No. 1877.

53. *Clavaria abietina* Fries.

In fir woods on Mary's Peak trail. October. No. 1731.

This plant has a thickened base, the branches wrinkle longitudinally when dry. The flesh is white but turns greenish when bruised. It has a bitter taste. Common in fir woods in western Oregon.

54. *Clavaria botrytis* Fries.

In coniferous woods, Blue River. November. Nos. 2152, 2157.

55. *Clavaria vermicularis* Fries.

In mixed woods, Corvallis. October. Infrequent. No. 2037.

56. *Calocera cornea* Weinm.

On dead fir wood, Corvallis. September to October. Frequent. No. 2062.

57. *Typhula phacorrhiza* Fries.

On fallen alder leaves, Philomath-Alsea road on Alsea Mountain, about a month after the fall rains begin. Frequent.

The hair-like clubs usually stand about 7–12 cm. tall from small disk-shaped, brownish sclerotia, 7–11 mm. in diameter by 1.5–3 mm. thick. This form is common in thick stands of alder in western Oregon and Washington.

3. Family THELEPHORACEAE

58. *Craterellus cornucopioides* (L.) Pers.

On ground among *Gaultheria shallon* in a clearing of coniferous woods, near Mary's Peak, Benton County. December. Infrequent. No. 2167. Collected by C. C. Epling.

This plant was not reported west of Missouri in Burt's monograph. It is plentiful when found, and is larger than usual, reaching 12 cm. high and 7 cm. broad.

59. *Stereum fuscum* (Schrader) Quél.

On alder, Corvallis. May. Infrequent. No. 1948.

60. *Stereum purpureum* Pers.

On pear trunk, Corvallis. December. Infrequent. No. 2214.

No "silver leaf" has been observed in connection with infections of this fungus.

61. *Thelephora palmata* (Scop.) Fries.

On the ground in pathways in mixed woods. In the hills northwest of Corvallis and on Mary's Peak. March. Infrequent. No. 2091.

62. *Corticium lactescens* Berk.

On oak, Baldy Peak and Corvallis. March and September. Frequent. Nos. 1771, 1965.

63. *Coniophora cerebella* Pers.

This very active wood-destroying organism was found near Philomath, on the charred bark of *Thuja plicata*, *Pseudotsuga taxifolia* and *Tsuga heterophylla*. Although known from Washington and California *Coniophora cerebella* has not been previously reported from Oregon. Nos 1795, 1796, 1797.

64. *Cyphella marginata* McAlpine.[2]

On twigs of peach, apple and almond, Marion, Benton, and Douglas Counties. May to July. Frequent. Nos. 1830, 1831, 1922, 1940, 2102.

Previously this fungus has been reported from Australia only. There is no record of the importation of nursery stock which would carry this fungus from Australia into Oregon. The fungus is inconspicuous and is perhaps of little, if any, economic importance. In Australia McAlpine observed this fungus on dead twigs of peach but in Oregon it is abundant on "die-back" twigs of peach and apple and has been found in one locality on almond. The cupules are minute, resembling fuzzy, gray or ochraceous goblets. They are peziza-like in appearance, about 0.5–1 mm in diameter.

65. *Peniophora glabra* (B. & C.) Burt.

On Douglas fir, Corvallis. September. Infrequent. No. 1860.

66. *Peniophora globulosa* Bres.

On decayed wood in mixed woods, Corvallis. August. Infrequent. No. 1813.

67. *Peniophora incarnata* (Fries) Cooke.

On oak, Corvallis. March. Infrequent. No. 1906.

68. *Peniophora cinerea* Fries.

On alder, Philomath-Alsea road on Alsea Mountain. November. Infrequent. No. 2230.

69. *Hymenochaete spreta* Peck.

On alder and Douglas fir, Corvallis. August and February. Infrequent. Nos. 1852, 1896.

70. *Aleurodiscus subcruentatus* (B. & C.) Burt.[3]

On *Pseudotsuga taxifolia* and *Abies grandis*, Corvallis. August and September. Frequent. Nos. 1722, 1809, 1931.

According to Dr. Burt this was "described from a collection made in Japan about 60 years ago by the U. S. Northern Pacific Exploring Expedition." Since the publication of his monograph of the genus *Aleurodiscus* he has "received Oregon collections and collections from Japan and California. This is not recorded as turning up before since the original collection."

71. *Aleurodiscus amorphus* (Pers.) Rohh.

On fir bark, Corvallis. November. Frequent. No. 1791.

[2] McAlpine, D. Fungous diseases of stone-fruit trees in Australia 120–122. 1902.

[3] Burt, E. A. Thelephoraceae of North America. XII. Stereum. Ann. Mo. Bot. Gard. 7: 237. 1920.

4. Family HYDNACEAE

72. *Hydnum ochraceum* Pers.

On Douglas fir stump, Corvallis. August. Frequent. No. 1806.

73. *Hydnum erinaceus* Bull.

On Douglas fir log, Philomath. October. Frequent. No. 2135.

74. *Hydnum auriscalpium* Linn.

On cones and needles of *Pseudotsuga taxifolia*, Corvallis. November to January. Frequent. Nos. 2138, 2221.

75. *Hydnum repandum* Linn.

In open woods, various localities in western Oregon. November. Frequent. Nos. 2136, 2193.

The western plants are a deeper orange than the pale buff plants I have collected in the middle west.

76. *Hydnum subfuscum* Peck.

On coniferous bark, Mary's Peak trail. October. Frequent. No. 1724.

77. *Echinodontium tinctorum* Ellis.

A resupinate specimen found on *Abies grandis*, Corvallis. April. Frequent. No. 1912.

78. *Irpex lacteus* Fries.

On cherry stumps or causing heart rot of living trees from large pruning cuts. Fall and spring. Frequent. No. 1824. This is the most common heart rot of sweet cherry in western Oregon.

79. *Odontia fragilis* Karst.

On oak, Corvallis. August. Infrequent. No. 1848.

80. *Radulum Oweensii* Lloyd.

On oak, Corvallis. March and April. Frequent. Nos. 1907, 1932.

5. Family BOLETACEAE

81. *Boletus chrysenteron* With.

In mixed woods, Corvallis. Comes with the early fall rains and persists until November. Common.

82. *Boletus luridus* Schaeff.

Under conifers, Oregon Agricultural College campus, Corvallis. September. Infrequent. No. 2058.

Although this plant has been reported from Washington and California, it had not previously been reported from Oregon.

83. *Boletus luteus* Fries.

Under conifers, Oregon Agricultural College campus, Corvallis. November. Common. No. 2035. This is a very common plant from early fall until the first freeze. It is always to be found under conifers in season.

84. *Boletus scaber* Fries.

Under various trees, Oregon Agricultural College campus, Corvallis. September. Infrequent. No. 2059.

If this were to be referred to one of Peck's varieties it perhaps would come nearest to *fuligineus*. Variety *testaceus* has also been observed in this locality.

85. *Boletus Zelleri* Murrill.

In coniferous woods, Corvallis. October to November. Frequent.

86. *Boletinus cavipes* Opat.

Under birch trees, Oregon Agricultural College campus, Corvallis. October. Infrequent. No. 2052.

This plant has not previously been reported west of the Rocky Mts.

6. Family POLYPORACEAE

87. *Cryptoporus volvatus* (Peck) Shear.

On *Tsuga*, *Pseudotsuga* and *Abies* in the Coast Range Mountains. September to November and spring. Frequent.

88. *Fomes annosus* (Fries) Cooke.

On *Pseudotsuga taxifolia* (log), Philomath-Alsea road. November. Infrequent. Nos. 1759, 2140.

89. *Fomes applanatus* (Pers.) Wallroth.

On wood of various deciduous trees, usually saprophytic but undoubtedly parasitic on the collar and roots of Italian prune trees. Frequent. Fall and spring. No. 1959.

The form of this fungus having a white context (*Fomes leucophaeus* Mont.) is very commonly found in western Oregon. This form has been observed upon thoroughly water-soaked, decayed wood of *Populus* and *Acer*. Specimens which were brought into the laboratory to dry became the usual brown color which progressed upwards from the tubes as the fungus dried out. Perhaps this white color is associated with a thoroughly saturated condition which does not allow of the usual oxidation.

For two years the progress of root rot in prune trees caused by *F. applanatus* has been watched with interest. In November, 1919, an orchard of about 20 acres in Douglas County was visited and many trees had blown over in a recent wind storm. The trees had blown over while in full leaf and some in full fruit. An examination of the fallen trees to ascertain the cause of root weakness revealed a decayed condition of the roots. Many roots exhibited resupinate fruiting bodies of *F. applanatus* and all of the fallen trees (about 20) had the white butt-rot characteristic of *F. applanatus* decay. In the spring of 1921 the same orchard was visited and many more trees were observed with fruiting bodies on the lower portion of the trunk and on the roots. Such trees had very loose footing. Usually the infection could be traced from wounds near the base of the trunk or on shallow roots probably caused by cultivation machinery. The trees were in good soil and apparently otherwise in good vigor except that the upper trunk and larger branches showed heart rot due to *Trametes carnea*. In this case *Fomes applanatus* is at least a destructive *facultative* parasite.

90. *Fomes igniarius* (L.) Gillet.

On apple trees, Canyonville, Douglas County, and Corvallis. May and February. Infrequent. Nos. 1900, 1921.

91. *Fomes pinicola* (Swend.) Cooke.

On peach and prune trees, western Oregon. Frequent. Nos. 1786, 1815.

92. *Fomes roseus* (A. & S.) Cooke.

On *Abies grandis*, Corvallis. March. Rare. No. 1908.

I have seen but one specimen which I can refer to this species. This was definitely perennial, and ungulate with a black surface.

93. *Polyporus arcularius* (Batsch) Fries.

On oak wood, Corvallis. August. Infrequent. Nos. 1987, 1989. Not previously reported from the Pacific coast.

94. *Polyporus chioneus* Fries.

On oak and maple, Corvallis. October. Infrequent. Nos. 1753, 1974. One of these numbers was referred to *P. trabeus* Fries by Mr. Lloyd, but it surely differs but little from *P. chioneus*.

95. *Polyporus dryadeus* (Pers.) Fries.

On *Acer macrophyllum* and *Abies grandis*, Mary's Peak and Cascadia, respectively. September. Not infrequent. Nos. 1765, 2061. The dozen or more applanate fructifications on maple were on a dead stub but the one obtuse specimen on *Abies* was on a living tree. Although usually reported as found on living oak this species of late has been reported on a variety of hosts.

96. *Polyporus floriformis* Quel.

On decayed maple, Corvallis. October. Infrequent. No. 2019. Although this species usually has an attenuate or lateral stem-like base my specimens were sessile. To my knowledge this form has not been reported from west of Wisconsin.

97. *Polyporus fragilis* Fries.

On *Abies grandis*, Corvallis. October. Infrequent. No. 2016. This plant is white at first as usual in this species but when touched it changes to livid pink or flesh-colored when dried or brick-red when a bruised portion is dried. The spores are alantoid, 1–1.5 x 5 μ.

98. *Polyporus galactinus* Berk.

On prune, Riddle, Douglas County. November. Infrequent. No. 1792.

99. *Polyporus hirsutulus* Schw.

On sweet cherry, Corvallis. April and May. Frequent. Nos. 1933, 1934, 1937.

This form has not been reported from west of Missouri but it perhaps occurs wherever *P. versicolor* (L.) Fries is found, for it is probably a segregate of that species.

100. *Polyporus hirtus* Quél.

On ground, Powers. October. Infrequent. No. 2040.

101. *Polyporus Macounii* Lloyd.

On maple, Corvallis. October. Frequent. No. 2054. Perhaps another segregate of *P. versicolor*.

102. *Polyporus picipes* Fries var. *castaneus* Lloyd.

On maple log, Mary's Peak. October. Infrequent. No. 1742. This is a very clean, neat form of the species. It has a uniform tawny-olive color.

103. *Polyporus pubescens* (Schumacher) Fries.

On cherry, Corvallis. April. Frequent. No. 1834.

104. *Polyporus rufescens* Pers.

On oak stump, Corvallis. November. Infrequent. No. 1793.

105. *Polyporus sensibilis* Murrill.

On *Abies grandis*, Corvallis and Mary's Peak. October. Not infrequent. Nos. 1754, 2018.

This plant has been reported once from Oregon by Dr. Murrill, the collection taken at Glenbrook.

106. *Polyporus Spraguei* B. & C.

On dead *Quercus Garyana*, Corvallis. October No. 2114.

I have in my herbarium (No. 546) a collection of this species taken in Seattle, Washington. This is a considerable extension of range for the species from the Mississippi Valley.

107. *Polyporus zonatus* Fries.

On cherry and pear, Corvallis and Medford. Frequent. Nos. 1893, 1899.

P. zonatus has very little to distinguish it from *P. versicolor*, of which it is perhaps a segregate.

108. *Hexagonia carbonaria* B. & C.

On charred wood, Corvallis. February. Infrequent. No. 1887.

109. *Poria contigua* (Pers.) Karst.

On decayed wood of *Quercus Garyana*, *Corylus californicus* and sometimes *Acer macrophyllum*, western Oregon. Very frequent. Nos. 1723, 1808, 1888, 1891, 1920, 2220.

This is a most common brown *Poria* in western Oregon. It is sometimes found reflexed where moss fronds have been followed but infrequently it has been found reflexed without apparent provocation.

Dr. L. O. Overholts says concerning this fungus, "I have European material from Romell with which it agrees exactly. Romell has written me that he considers *P. contigua* identical with *Trametes tenuis* Karst., and I am inclined to the same opinion." The writer has reflexed specimens among those cited above and perhaps the plant should be listed under *Trametes*.

110. *Poria sanguinolenta* (A. & S.) Fries.

On oak fence post, Corvallis. March. Infrequent. No. 1902.

111. *Trametes carnea* (Nees) Cooke.

On peach, prune and conifers, western Oregon. Late fall, winter and spring. Extremely common. Nos. 1760, 1783, 1826, 1827, 1862, 1885, 1909, 1930, 2146.

Trametes carnea causes more than 90% of all the heart-rot of prune and peach trees in the orchards of western Oregon. It is extremely destructive, producing a rot which cannot be distinguished from that produced by this fungus in coniferous woods. I believe this fungus to be a true *Trametes*. It does not become perennial. I have watched the same stumps for several seasons and the fruiting bodies die each season and new ones appear in their stead the following season. There seems to be layered growth marked by horizontal lines in vertical cuts through the context but this evidently represents periodicity of growth during a season rather than perennial growth. I believe this is distinct from the perennial *Fomes roseus*.

112. *Trametes hetermorpha* Fries.

On *Pseudotsuga taxifolia*, Corvallis. March. Infrequent. No. 2092.

113. *Trametes hispida* Bagl.

On *Populus*, Freewater. May. Rare. No. 2017 (O. A. C. Herb. 2123).

This large fruiting body, 18 x 10 x 7 cm., is more or less of a monstrosity for this species. The tubes are extremely variable and large, reaching 25 mm. in length. The variation seems mainly to be one of size for in microscopic characters it is not very different from *T. hispida*.

114. *Merulius brassicaefolius* Schw.

In November, 1919, Mr. C. E. Waterman of Newberg sent me a specimen of this fungus which he collected from a sill of Douglas fir wood. The sills are about 20 inches from the ground and resting on oak blocks. The specimen of decayed wood sent with the fungus is a brown, dry rot which runs very rapidly during humid weather. The hyphae in the lumen of the tracheids are hyaline, 3–4 μ in diameter and septate with occasional clamp-connections. This collection extends the range of this fungus west from Louisiana. No. 1780.

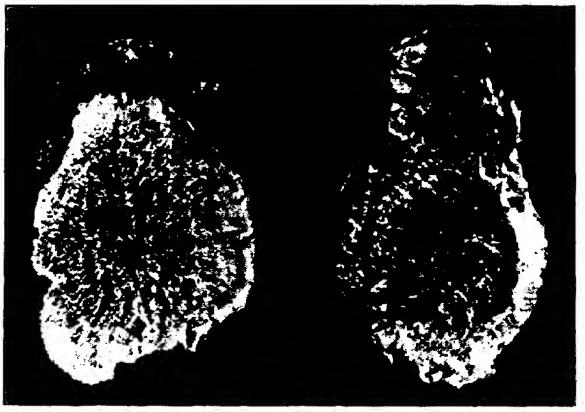


Fig. 1. Fructifications of *Merulius pilosus* Burt. Nat. size.

115. **Merulius pilosus** Burt, sp. nov.

Fructification resupinate, orbicular, fleshy, separable, drying capucine-buff, the margin entire, rather thick; hymenium at first with somewhat radial folds which become venosely connected and form shallow, angular, irregular pores about 1 to 2 to a mm.; in structure about 1–1¼ mm. thick, composed of densely arranged, hyaline hyphae, 3–4 μ in diameter, not incrusted; clavate gloeocystidia up to 60 x 10–12 μ are abundant in the subhymenial region; cylindric hair-like cystidia, 3–4 μ in diameter, emerge up to 40 μ in the hymenium; spores hyaline, even, 3 x 2 μ. Fructification 6–7 cm. in diameter.

On very rotten, decorticated, frondose wood, Corvallis, Oregon, September 28, coll. *S. M. Zeller 1772*, type (in Mo. Bot. Gard. Herb. 56849).

M. pilosus is distinguished by its capucine-buff color, fleshy structure, presence of gloeocystidia and cystidia, and the minute spores; gloeocystidia have not been found in any other North American species with the exception of *M. rugulosus* of the West Indies.

All of the above notes and diagnosis of *M. pilosus* was kindly sent to the writer by Dr. E. A. Burt. The accompanying photograph (Fig. 1) of the type was taken when the collection was made.

116. *Merulius tremulosus* Schrader.

Although Dr. Burt did not examine any specimens of this species from Oregon, it is very common on decaying, hard woods during the fall months.

6. Family AGARICACEAE

117. *Amanita muscaria* Fries.

In the sandy tide flats along Willamette River, Corvallis. September. Frequent. No. 2153.

This poisonous *Amanita* is very common in the early fall on the sandy bottom land along the Willamette river. The plants are very large and striking in color, the disk usually English red and the margin orange-chrome. A specimen reaching 28 cm. high and with a pileus 21 cm. broad weighed 3 lbs., 6 ozs.

118. *Amanita calyptrata* Peck.

In coniferous woods, Mary's Peak and Corvallis. October. Frequent. Nos. 1766, 2126.

119. *Amanita pantherinoides* Murrill.

In coniferous woods and open oak thickets, Corvallis. November. Frequent. No. 2150.

120. *Amanita solitaria* Fries.

Solitary on ground in oak woods, Corvallis. October and November. Rare. No. 2063.

This plant has not previously been reported from Oregon although it is known to grow on the Pacific slope in California. According to Dr. Gilkey it has been collected in past years in several counties in this vicinity. Our plants have practically no odor nor taste unless slightly farinaceous.

121. *Amanita chlorinosma* Peck.

Solitary on ground in scrubby oak thicket, Corvallis. October and November. Rare. Collected by Mr. Carl C. Epling (333).

This species is strikingly like *A. solitaria* in morphological characters differing, however, in size of spores and in odor. *A. chlorinosma* has a strong, marked odor. In the specimen cited above the odor was designated as "of potash or of strong alkaline urine."

122. *Amanitopsis vaginata* Fries.

In coniferous woods mostly, Mary's Peak. October. Common. No. 1778.

The common variety of this species to be found in western Oregon

is *livida*. The white form, *alba*, is rarely to be seen. The grayish-mouse-colored variety attains a very large size in the mountains of the coast range. My collection has the pileus hair-brown in color, 10–18 cm. broad, and the plants reach 28 cm. high. Scales on the stipe are mouse-gray.

123. *Lepiota clypeolaria* Fries.

In mixed or coniferous woods, Corvallis. November. Commonly found west of the Cascade Mountains. No. 2183.

124. *Lepiota granulosa* Fries.

In mixed woods, Corvallis. October. No. 2033. This species is common throughout western Oregon.

125. **Lepiota pulcherrima** sp. nov.

Pileus 6–12 cm. broad, subhemispheric at first, then convex to quite plane, moderately fleshy, young buttons quite solid, acajon-red to Vandyke red at the center, venetian- or alizarine-pink on the margin, often fading to a silvery livid-pink in age; cuticle on margins of older specimens split; surface appearing velvety because of the innate-pubescence towards the center, nearly glabrous or silky on the margin or squamulose when closely covered by another pileus, becoming slightly appressed-scaly in age due to growth. Margin sterile. Flesh white, rather thin except disk. Gills free, white, close, broad, rounded behind, edges even. Stem 5–10 cm. long, 8–12 mm. thick, equal or tapering upward, slightly bulbose, peronate by a thin membrane colored like this pileus about one half to two thirds of the way up to the rather large, flaring, rather fleshy, persistent annulus, white within, white to pinkish above the annulus. Spores smooth, white, oblong, 3–4.5 x 5–8 μ, usually uniguttulate. Pleasant flavor. Odor mildly farinaceous.

Gregarious to caespitose. Growing from a distinct, heavy spawn in needle mould under *Pseudotsuga taxifolia*. (November to December.)

This is the most beautiful species of *Lepiota* with concolorous pileus and booted stem which the writer has ever seen. It is distinctly characterized by the rich color and surface of the pileus and the color and peronate character of the stem. It has been found at two stations in this locality and in one of these evidently growing from the same spawn for two seasons in succession.

Specimens examined: Oregon, Corvallis, *J. W. Severy* and *S. M. Zeller* 2123, type (in Zeller Herb. 2123, N. Y. Bot. Gard. Herb. and O. A. C. Herb. 3390); *S. M. Zeller* 2171, 2172 and *C. C. Epling* 72 (all in Zeller Herb.).

126. *Lepiota rubrotinctoides* Murrill.

In coniferous woods, Corvallis. This species is very common from October to December and lasts for about four weeks after the rains begin. This often would be mistaken for *L. rubrotincta* Pk. by eastern collectors but it differs in the darker almost black disk and the spores average considerably smaller. The stipe often has rosy tints especially below the annulus.

127. *Armillaria albolanaripes* Atkinson.

On ground in coniferous woods, Corvallis. October and November. Common. No. 2131. This species has been reported from Oregon and California, but the writer has collected it as far north as Seattle, Washington.

128. *Armillaria corticata* (Fries) Pat.

On maple, Corvallis. November. Nos. 2053, 2154. This species has the appearance of a *Pleurotus* except for the presence of a veil which leaves an evanescent annulus or remnants on the margin of the pileus. This is the first report of the species from Oregon.

129. *Tricholoma bicolor* Murrill.

In mixed woods, Corvallis. October to December. Frequent. Nos. 2137, 2124.

This beautiful buff *Tricholoma* has commonly been found in either deciduous or coniferous woods in and about Seattle, Washington, and near Corvallis, Oregon. It is not among the first Agarics to appear after the rains start in the fall, but comes on in about three weeks and may be found until the first freezing weather. This species usually appears to some extent again in the spring but not so abundantly as in the fall. The dry, pruinose, buff cap and the extremely bitter taste are the characters which distinguish this from other Pacific coast species of the genus.

130. *Tricholoma personatum* Fries.

In mixed or coniferous woods, September to December. Common.

This species is one of the most widely distributed of the Agarics in western Oregon. It is mentioned here because of the enormous size attained, pilei over 18 cm. broad having been measured. It has been collected as late in the winter as January 4. At McMinnville several perfect "fairy rings" were observed on December 2. One of these measured 15 feet in diameter.

131. **Tricholoma subannulata** (Peck) comb. nov.

In lawns under deciduous trees, Corvallis. October to November. Infrequent. Nos. 2195, 2222.

Unfortunately Peck described this species from dried specimens and included it in *Armillaria*.[4] In *North American Flora* (10: 30, 1914), Murrill recombined the species as *Melanoleuca subannulata* (Peck) Murr. Since the species was described from dried specimens some of the distinguishing characteristics were overlooked. The plants are cinnamon to Mars-brown when fresh and although viscid in damp weather the surface is often somewhat scabrous. The gills are white with pinkish tints becoming tan when bruised, and they distil moisture during humid weather. They are not broad, anastomose or fork in the middle or behind, broader and rounded behind, marked by distinct transverse ridges or striations which persist in the dried specimens. The stipe is usually short, stout, 4–10 cm. long and 1.5–5.5 cm. thick. The odor is strongly but pleasantly farinaceous.

132. *Clitocybe odora* Fries.

In open wood lots, usually in mixed woods, Corvallis and Philomath. October to November. Nos. 2116, 2176.

This species which has not been reported west of Michigan is a rather common species in the Willamette Valley. The pileus is usually 5–8 cm. broad but plants have been found 10 cm. broad.

[4] Peck, Bull. Tor. Bot. Club 36: 330. 1909.

133. *Pleurotus sapidus* Schulzer.

On maple, Corvallis. November. Rare. No. 2147.

The spores in ours are 8–11 x 3–4 μ, becoming a very distinct pale lilac in mass. The pileus is tan to ochraceous-yellow or gray. In *North American Flora*, the range of distribution is given as far west as the Rocky Mountains.

134. *Pleurotus serotinus* Fries.

On apple wood, Corvallis. December. No. 2069. This species has been observed on various hard woods very late in the fall, but it seems to be very frequent on winter-injured apple wood.

135. *Hygrophorus eburneus* Fries.

In oak thickets and woods, Corvallis. September to November. No. 2044. This is one of our most common early mushrooms.

136. *Hygrophorus miniatus* Fries.

In dense Douglas fir woods, on moss, about four miles west of Alsea. August. Observed but once and under conditions such that no collections were made. The plants were a deep vermillion with a white foot of the stem as in var. *sphagnophilus* Pk. but were growing in heavy mats of *Hylocomium triquetrum* instead of a Sphagnum bog.

137. *Lactarius pyrogalus* Fries.

In coniferous woods, Powers. October. No. 2041, collected by F. E. Price. One lone specimen of this poisonous species was sent in for identification. It is quite typical of those reported farther east.

138. *Russula ochrophylla* Peck.

One plant of this species was collected near Corvallis and brought in to our Mushroom Show in November. It was exceptionally large, measuring 14 cm., but agreeing in all other characters with the usual descriptions. Several specimens were observed in an oak grove at McMinnville in December.

139. *Cantherellus aurantiacus* Fries.

A typical specimen of this species was sent in from Elgin.

140. *Cantherellus floccosus* Schw.

In damp, thick coniferous woods, Corvallis and Mary's Peak. October to November. Not infrequent.

141. *Cantherellus infundibuliformis* Fries.

On damp soil in coniferous woods. Philomath. November. No. 2156. Although this fungus has never been reported from the Pacific states it is not a rare plant in western Oregon and Washington.

142. *Marasmius plicatulus* Peck.

Under pine on Oregon Agricultural College campus. December. No. 2173. This is a beautiful velvety species.

143. *Trogia crispa* Fries.

On prune bark, Corvallis. March. No. 2088. This is the first report of this species west of the Rockies. Collection was made by C. E. Owens.

144. *Lenzites saepiaria* Fries.

This species is mentioned here because of its occurrence as a wound parasite on peach and prune. It becomes quite a serious pest on peach trees when the orchards are adjoining coniferous woods. Nos. 1779, 1784, 1785, 1931.

145. *Lenzites vialis* Peck.

On pruning wounds of apple trees, Roseburg, Douglas County. May. Infrequent. No. 1994.

146. *Pholiota spectabilis* Fries.

At the base of Douglas fir stumps, Corvallis. October to December. Frequent. No. 2122.

This plant grows to extremely large sizes in Oregon. The writer has collected specimens with pilei 8 in. broad and Professor Lake reports one over 12 in. broad, his photograph of which I could not resist publishing herewith (Fig. 2).

FIG. 2. Plant of *Pholiota spectabilis* having a pileus over 12 inches in diameter. Photo by Professor E. R. Lake.

147. *Inocybe fastigiata* Bres.

In mixed woods, Corvallis. October and November. Frequent. No. 2201.

148. *Naucoria semiorbicularis* Fries.

In lawns, Corvallis. October. Frequent. No. 2042.

149. *Agaricus diminutivus* Fries.

In mixed woods, Corvallis. October. Rare. No. 2029.

150. *Agaricus subrufescens* Peck.

In mixed woods, Corvallis. October. Rare. No. 2155.

This plant is mentioned here because to my knowledge it has not been previously reported from Oregon and because of its enormous size. The pileus of the plant collected measures 26 cm. broad and the stipe 24 cm. long with a diameter of 3.5 cm. above and 5.5 cm. below.

151. *Stropharia aeruginosa* Fries.

Under oaks on hills near Corvallis, November. Rather frequent. No. 2133.

152. *Stropharia ambigua* (Pk.) Zeller.

This is one of the most conspicuous of the Agarics to be found in coniferous and mixed woods of western Oregon during October and November. Nos. 1875, 2127.

153. **Stropharia rugomarginata** Zeller & Epling, sp. nov.

Pileus 6–12 cm. broad, fleshy, convex or broadly conic, becoming expanded to plane, glabrous, disk even; margin *reticulate-rugose* (pitted), pinkish-buff or cinnamon on the disk, drying cinnamon-buff to tawny-olive; flesh thin, whitish; lamellae crowded, thin, watery, broadly-adnate or slightly decurrent, edge undulate, minutely-serrate, concolorous becoming cinnamon, then tawny-olive in age, drying cinnamon-brown; spores ovoid-ellipsoid, appearing truncate at the apex because of a distinct germpore through the heavy exospore, usually obliquely-apiculate at the broader end, 8–9.5 x 4.5 μ, cinnamon-brown in mass when moist, mummy-brown when wet and Saccardo's umber when dry; basidia clavate-cylindric, 8.5 x 30–35 μ; stipe fleshy, solid or stuffed, glabrous, concolorous or whitish and shining above, subequal, tapering slightly either way, 6–12 cm. long, 12–15 mm. in diameter; annulus ample, persistent but sometimes disappearing at maturity, whitish. Odor and taste mild and not distinctive.

In lawns under conifers. Solitary or subgregarious. December.

Stropharia rugomarginata is distinguished by the characters of the pileus and spores. The reticulate ridges on the pileus cause a pitting of a band of the surface near the margin about 1–2 cm. broad. The disk is even. In the younger plants the reticulate-rugose character disappears with drying but in the older plants it is retained as a faint, smooth, reticulation. The spores are distinctive in shape and color. The egg-shaped spore has a distinct germ pore at the apex causing a truncate appearance and is usually attached obliquely at the broad end. When the spores were placed in enzyme solutions they threw out the germ tubes through the germ pores. When first shed in mass they appear more or less ochraceous but as they dry they become purplish-brown.

Specimens examined: Oregon, Corvallis, *S. M. Zeller* 2180, type (in Zeller Herb.) and *C. C. Epling* 314 (in Epling Herb.).

154. *Hypholoma fasiculare* Fries

On dead wood, both coniferous and deciduous, Corvallis. October until frost. Nos. 1869, 2185.

This is undoubtedly the most common *Hypholoma* in the northwest. It is usually reported as saprophytic on coniferous wood but it is often found on deciduous trees and shrubs. It grows from the dead portions of the crowns of cane fruits (*Rubus*) but it has not been determined whether this infection was originally parasitic or merely following death of portions of the host due to other causes. In the Medford district, Jackson County, fruiting bodies were found at the base of apple trees

dying from root troubles, the cause of which is unknown to the writer who would hesitate to lay the cause definitely to this fungus. The symptoms of the diseased condition in these trees began by a slight yellowing of the foliage and reddening of the bark. The last year before the fruiting bodies of *Hypholoma fasiculare* appeared at the crown of the trees they bore a bumper crop but when tested they could be easily pushed over, for the roots were almost entirely decayed next to the crown. McAlpine[5] has reported *Hypholoma fasiculare* to be *parasitic* on the roots

129. 1902.

of raspberry and cherry in Victoria.

155. *Hypholoma capnoides* Fries.

On fence posts of *Abies* wood. Not commonly found; but abundant where found, Corvallis. November. Nos. 1868, 2204.

156. *Hypholoma hydrophilum* Fries.

Caespitose in large clusters on moss-covered, decayed logs, Philomath. November. No. 2197.

Our plant is not *H. hydrophilum* Fries (sense of Saccardo). These spores are 5–6 x 2.5–3 μ and there are no cystidia. The gills distil considerable moisture during damp weather.

157. *Hypholoma lachrymabundum* (Fries) Quél.

In coniferous woods, Corvallis. November. Rare. Epling No. 73.

This collection follows the description of *H. lachrymabundum* given by Kauffman[6] with the exception that it may be slightly darker. The spores are smooth, elliptical, *not curved* but flattish on one side.

158. *Hypholoma velutinum* (Fries) Quél.

On low ground under maples, Corvallis. October. Rare. No. 2055.

This collection agrees very well with my collection 1506 of the same species taken in Tower Grove Park, St. Louis Missouri. The spores are ovoid to *subcitriform with a hyaline apiculum, tuberculate*, dark purplish-umber when mature, 10 x 6–7 μ. The edges of the gills distil droplets darkened by suspended spores.

159. *Gomphidius oregonensis* Peck.

In damp coniferous or mixed woods, Corvallis. November. No. 2194.

This is one of the very common Agarics which comes shortly after the rains begin in the fall and may be found quite generally distributed in the wooded portions of western Oregon and Washington and is abundant. This was reported by Professor Lake as being a very palatable mushroom.

7. Family LYCOPERDACEAE

160. *Geaster delicatus* Morgan.

In humus soil under coniferous trees, Corvallis. October. Rare. No. 2047. This small species is mentioned here because it has not been reported from Oregon.

[5] McAlpine, D. Fungous diseases of stone-fruit trees in Australia. 125, 129. 1902.

[6] Kauffman, C. H. Agaricaceae of Michigan, 250.

161. *Geaster hygrometricus* Pers.

In oak thickets and coniferous woods, Corvallis and Portland. October and November. Not common. Nos. 1975, 2115. This is the large variety which Lloyd [7] has designated as *gigantea*. Our largest specimen measures 11.5 cm. when expanded.

162. *Geaster lagenaeformis* Vitt.

On ground under oaks on hills to northwest of Corvallis. October. No. 2049. This plant is very characteristically flask-shaped in the button stages. It is not commonly found in western Oregon.

163. *Geaster Morganii* Lloyd.

In oak woods, near Corvallis. October to November. Rare. No. 2048.

This collection of *G. Morganii* is perhaps the first reported from the Pacific coast. This collection contains four opened "stars" and one button. The plants do not differ from the eastern plants and are easily distinguished from other local species by their reddish-brown color and the cone-shaped, sulcate mouth of the endoperidium.

164. *Geaster saccatus* Fries.

On ground under *Acer macrophyllum*, near Corvallis. October. Rare. No. 2046.

This plant agrees with the description as given by Fries and is the same as that distributed by Ellis and Everhart (Fung. Col. Exs. No. 1217) but as far as the writer can learn it has not been reported from the west before.

165. *Lycoperdon cruciatum* Rostk.

On the ground, campus of Oregon Agricultural College, Corvallis. September. Not infrequent. No. 2022.

166. *Lycoperdon elegans* Morgan.

On ground under mixed trees, Corvallis. September. Infrequent. No. 1883.

167. *Lycoperdon fuscum* Bonar.

On ground in dense coniferous woods near Corvallis. November to December. Frequent. No. 1880. This apparently grows year after year from the same spawn which can be turned up at any season of the year.

168. *Lycoperdon gemmatum* Batsch.

Pastures and open woods, Corvallis. October to December. Frequent No. 1881.

169. *Lycoperdon pyriforme* Schaeff.

On decayed wood of various species, Corvallis. November to December. Frequent. No. 1884.

170. *Lycoperdon pratense* Pers.

In lawns, Corvallis. August to October. Frequent. Nos. 1720, 1854.

171. *Lycoperdon pusillum* Batsch.

In lawns, Corvallis. August to October. Frequent. No. 2024.

172. *Lycoperdon rimulatum* Peck.

In lawns of Oregon Agricultural College campus, Corvallis. August to September. Frequent. No. 2025.

[7] Lloyd, C. G. The Geastrae. Bull. 2: 10. 1902.

173. *Lycoperdon Wrightii* Berk.

In spots where the grass is sparse, on Oregon Agricultural College campus, Corvallis. November. Infrequent. No. 2229.

174. *Bovista montana* Morgan.

On ground at the edges of coniferous woods, in lawns and cultivated gardens, Corvallis. May to September. Frequent. Nos. 1751, 1935, 2006.

175. *Bovista plumbea* Pers.

In cultivated gardens, Corvallis. August to September. Frequent. Nos. 2007, 2060.

176. *Catastoma circumscissum* (Berk.) Morgan.

In lawns, Oregon Agricultural College campus, Corvallis. August. Rare. No. 2208. Hard says this species "seems to be confined to the middle west."

177. *Calvatia gigantea* Batsch.

This species is found infrequently in pastures in various parts of western Oregon. A specimen from Multnomah County, collected in September, weighed 6 lbs. 7 oz. and measured 28 x 23 x 18 cm.

178. *Calvatia lilacina* Berk.

In open fields, lawns and cultivated gardens, Corvallis. August to November. Frequent. Nos. 1964, 2016, 2026.

Lloyd has called our western form var. *occidentalis*. It differs in being smaller and having less development of the sterile base.

179. *Calvatia rubro-flava* Cragin.

In mixed woods, north of Corvallis. September. Rare. No. 1995. I believe this is the first report of this species from the northwest.

8. Family SCLERODERMATACEAE

180. *Scleroderma cepa* (Vaill.) Pers.

Gregarious or caespitose, along sidewalks, High School ground, Corvallis. September and October. No. 2014.

The peridium in our plants is glabrous, sometimes cracked, warm buff or darker, sometimes buckthorn-brown, becoming light ochraceous-salmon to russet where bruised, reaching 12 cm. broad and 5 cm. high, about ⅓ emergent. Odor at first farinaceous, then disagreeable. Gleba a dark livid-brown just under the peridium and a warm blackish-brown or black near the center and base. Spores livid-brown to deep livid-brown under scope, spherical, sharply echinulate, 8–13 μ, according to maturity.

181. **Sclroderma hypogaeum** sp. nov.

Fructifications subglobose to irregular, firm but pithy when young, deliquescent with age, 1–7 cm. in diameter, color light buff to pale ochraceous-buff or even avellaneous, becoming bay to almost black when beginning to deliquesce. Surface glabrous or of innate-appressed fibrils. Mycelium of white rhizomorphs attached to the somewhat downward projecting sterile base. Peridium reaching 3 mm. thick, compact, hyaline; gleba at first white, then yellowish, turning purplish-umber at maturity (drying black where cut); tramal septa white, variable in thickness, of parallel, hyaline hyphae, gelatinizing and deliquescing at maturity; fertile cells at first filled with a hyaline, basidia-bearing capillitium, later filled with spores and remnants of capillitium; basidia hyaline, pyriform

to subglobose, 10–13 x 8–10 μ, usually 4-spored; sterigmata short, 3–4 μ long; spores subglobose, dark purplish-umber, alveolate-reticulate, 11–25 μ (average 14 μ). Odor pleasant farinaceous when young but becoming strongly alkaline when deliquescing. Taste farinaceous when young.

In clay soil under lawn sod. October to November and sometimes in spring.

S. hypogaeum is like *S. cepa* in that the peridium is glabrous but is entirely different from other species in the alveolate-reticulate character of the spores and its entirely hypogaeous habit. The spores are larger than reported for most species of *Scleroderma*. They average about 14 μ but in extreme cases they have been found to measure 30 μ when fresh. The measurements reported above are based on the dry specimens. The photograph (Fig. 3) presented herewith illustrates the hypogaeous habit of the fungus. It very rarely comes even with the surface of the soil.

Very early stages of this species have been killed and embedded for a histological study of the development of the sporophores. Specimens examined, Oregon: Corvallis. *S. M. Zeller* 1567, 1725, type (in Zeller Herb. and O. A. C. Herb. 3391); Philomath. *S. M. Zeller* 2139 (in Zeller Herb.).

Fig. 3. *Scleroderma hypogaeum*, showing the hypogaeous habit of the plant. Nat. size.

182. *Scleroderma aurantiacum* Bull.

In path in open field, Corvallis. November. Rare. No. 2211. Marked by the brassy-yellow peridium which is reticulate-rimose producing a more or less warty surface.

183. *Polyaccum turgidum* Fries.

In cultivated garden, Corvallis. September. Rare. No. 2050. Collected by Dr. Helen M. Gilkey, who says there have been as many as sixty fruiting bodies of this fungus in their garden during one autumn (Fig. 4).

The description of *P. turgidum* is the nearest to that of this collection that we could find available. The description of the Corvallis collection is given below for reference:

Fructifications clavate, 6–15 cm. broad above, 12–25 cm. long, firm; surface shiny amber to blackish-brown at maturity, areolate where the peridioles show through; peridium more or less gelatinous, up to 2 mm. thick below, very thin to deliquescent or entirely dehiscent above; gleba at first gelatinous then powdery, at first yellow-ochre, then purplish-black when still gelatinous, becoming mummy-brown when powdery; septa persistent, forming cavities containing the *peridioles* which are subspherical to gyrose, reaching 3 mm. broad and 7 mm. long, Natal-brown; stipe 6–8 cm. broad, 7–14 cm. long, surface more or less lacunose with large longitudinal cords or rhizomorphs, interior at first yellow-ochre then bister at maturity, solid. Spores 7.5–11 μ, spheric, echinulate with close, fine, sharp spines, brownish-purple under scope, Natal-brown in mass, 1–3 guttulate, exospore about 1–1.5 μ thick.

Fig. 4. *Polyporus sargidum*, showing the general habit of a mature sporophore. $\frac{1}{3}$ nat. size. Photo by Professor E. R. Lake.

184. *Arachnion album* Schw.

On lawns, Oregon Agricultural College campus, Corvallis. August. Infrequent. No. 1099.

9. Family HYMENOGASTRACEAE

185. *Rhizopogon diplophloeus* Zeller & Dodge.

In damp humus soil under *Quercus Garryana*, Corvallis. December. Rare. No. 2169.

186. *Rhizopogon induratus* Cooke.

In clay soil, Corvallis. December. Rare. No. 2168.

187. *Rhizopogon maculatus* Zeller & Dodge.

In humus or clay soil, under *Pseudotsuga taxifolia*, Corvallis. October to January. Rare. Nos. 2015, 2228.

This is the first report of this species outside of the type locality in California. It differs from the type in its thicker peridium (200 μ in places). The white outer layer of the duplex peridium is about 160 μ thick where the two layers total 200 μ. The outer layer varies in thickness while the inner layer is quite consistently 40 μ. The outer peridium is easily separable. The fibrils are almost white when fresh. The mycelium in the soil is in very fine fibrils hardly large enough to designate as rhizomorphs and gives to the soil a grayish-olive color. The fresh fructifications are almost odorless.

188. *Rhizopogon roseolus* (Corda) Zeller & Dodge.

In humus soil, under *Pseudotsuga taxifolia*, Corvallis. November. Not infrequent. Nos. 2132, 2141. The fructifications have a farinaceous odor when young but when ageing they possess an extremely foul odor.

189. *Rhizopogon rubescens* Tul.

In wood rat diggings in leaf mould, under conifers, McMinnville and Alsea. August and December. Not infrequent. Nos. 1962, 2170.

190. *Arcangeliella candata* Zeller & Dodge.

On ground in leaf mould under *Quercus Garyana*, Corvallis. April. Rare. No. 2005. There are no apparent differences between this collection and the type collection from California

191. *Gautieria morchelliformis* Vitt.

In humus under hazel, seven miles west of Alsea. August. Rare. No. 1969. This collection differs from those previously examined in that the columella is branched and reaches half way to the summit of the fructification. The odor when fresh is strongly foetid.

192. **Gautieria Parksiana** Zeller & Dodge, sp nov.

Fructifications gregarious, subglobose to irregular, 1–5 cm. in diam., some specimens drying light ochraceous-buff to ochraceous-tawny, others drying buckthorn-brown to mummy-brown; rhizomorphs white, 1–2 mm in diam., usually branching from a distinct radicle; columella branched; peridium persistent, 240–420 μ thick, stupose, of very fine hyphae; gleba drying ochraceous tawny to Dresden-brown; cavities 3–4 per mm., empty, globose to irregular; septa 63–100 μ thick, hyaline, of interwoven hyphae generally extending longitudinally; basidia clavate, arising from the trama obliquely, usually 2 spored, 28–38 x 7–10 μ hyaline (Fig. 51; sterigmata 3–14 μ long; spores ovate to citriform, buckthorn-brown in mass, pale olivaceous under microscope, with 9–11 (usually 10) rounded, longitudinal ribs giving the appearance of striations, 7–11 x 14–19 μ, nucleus equitorially placed (Figs. 5, 6).

In soil under *Heteromeles* and *Pseudotsuga*. Oregon to California. March to June.

In a previous publication[8] we tentatively included *Chamonixia* Rolland in the genus *Gautieria* because in the early stages of the latter a peridium is evident. At that time we had not had the opportunity to collect and

[8] Zeller, S. M., & Dodge, C. W. *Gautieria* in North America. Ann. Mo. Bot. Gard. 5: 133–142. 1918.

examine fresh specimens of species having a more or less persistent, thick peridium nor those having a thin peridium evanescent at an early stage of development. Since then the observations of one of us and the valuable data, which H. E. Parks of the University of California is continuously procuring, have proven to us yet more conclusively that *Chamonixia* should be reduced to synonymy or at least subgeneric rank.[5] We have in *Gautieria Parksiana* possibly as true a *Chamonixia*-type as presented in *Chamonixia caespitosa* Rolland. The peridium is thick and persistent. Parks says that in plants (his collection Nos. 356, 812) which had dried in the soil during June the peridium still persisted although ruptured in many places. The Oregon collection cited below was taken in June and these plants exhibit a thick peridium. Parks' collections in June were taken from the same area of ten square feet of soil where the type collection of 47 fructifications had been collected during the previous March. We take great pleasure in dedicating this species to Mr. Parks.

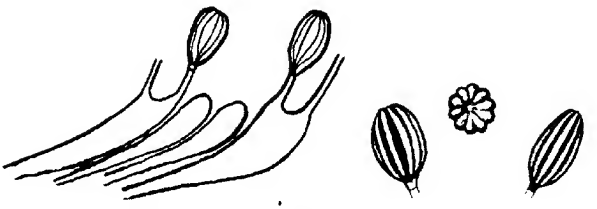


Fig. 5. Basidia and paraphyses of *Gautieria Parksiana*. × 600.
Fig. 6. Spores of *Gautieria Parksiana*. × 900.

Gautieria Parksiana is distinct from *Chamonixia caespitosa* in several characters. The bruised outer surface and cut surfaces of the peridium do not turn blue; the distinct, radicate rhizomorph leads to a branched columella which is not so distinct nor does it divide the fructification into such distinct portions as described for the columella of *Chamonixia caespitosa*. The spores of *G. Parksiana* are not guttulate and average smaller than those of *C. caespitosa*. We will defer recombining *C. caespitosa* until authentic material of this species is examined.

Specimens examined. Oregon: Benton County: Corvallis, *S. M. Zeller* (in Zeller Herb. 1050 and O. A. C. Herb. 3362). California: Saratoga, *H. E. Parks* 441, type (in Parks Herb. 441, in Zeller Herb. 1678, and in Dodge Herb. 14961); Guadalupe Mines, *H. E. Parks* (in Parks Herb. 415 and Zeller Herb. 1692).

103. *Gymnomyces pallidus* Massee & Rodway.

Fructification irregular, 3–4 cm. in diameter, light-buff when fresh drying ochraceous-buff to yellow-ochre; peridium, stipe, and columella lacking; gleba light-buff when fresh, drying light ochraceous-buff; no sterile base; cavities 1–2 mm. broad when fresh 3–4 to the mm. when dry, irregular; septa hyaline, about 80 μ broad, not scissile; basidia

hyaline, clavate, 2-spored; 8–9 x 25–30 μ; sterigmata 3–5 μ long; spores subglobose, hyaline, 8–11 μ, verrucose, uniguttulate, often short-caudate; odor fragrant.

In clay soil under leaves of *Quercus Garyana*, Corvallis, Oregon, December. Rare. Collected by L. M. Boozer. No. 220[illegible] (O. A. C. Herb. 3393).

The one fructification in the Corvallis collection is described above. It follows very closely the original description of *Gymnomyces pallidus* but the writer has not examined authentic specimens of this species. This plant has nearest affinities with *G. Gardneri* Zeller & Dodge through its spore characters, but is markedly different in that it has no columella. The fragrant odor is that so characteristic of many fleshy polypores. *Gymnomyces pallidus* has not been known outside of its type locality in Tasmania.

10. Family NIDULARIACEAE

194. *Cyathus stercoreus* Schw.

On soil, Mary's Peak, Benton County. October. Common. No. 1996.

195. *Cyathus vernicosus* Bull.

In cultivated soil, Corvallis. November. Common. No. 1977.

196. *Crucibulum vulgare* Tul.

On organic matter, Corvallis. October. Common. No. 2057.

197. *Sphaerobolus stellatus* Tode.

On decayed wood, Corvallis. November. Infrequent. No. 1799.

FUNGI IMPERFECTI

1. Family MELANCONIACEAE

198. *Cylindrosporium aceroinum* Tracy and Earle.

On leaves of *Acer circinatum*, Mary's Peak, Benton County. July. Frequent. No. 1943.

2. Family MONILIACEAE

199. *Sepedonium chrysospermum* (Bull.) Fries.

On *Boletus luteus*, Corvallis. September to November. Frequent. Determined by C. C. Epling. No. 2177.

200. *Mycogone puccinoides* (Preuss) Sacc.

On *Boletus* sp., Corvallis. September. Rare. Determined by C. C. Epling. No. 1360.

201. *Mycogone roseola* Pound and Clem.

On *Helvella crispa*, Corvallis. December. Rare. No. 2178.

202. *Ramularia Oxalidis* Farlow.

On leaves of *Oxalis oregana*, Mary's Peak, Benton County. July. Frequent. No. 1944.

3. Family DEMATIACEAE

203. *Cercospora fasciculans* Atkinson.

On *Panicum* sp., Mary's Peak Trail, Benton County. July. Infrequent. No. 1997.

To the writer's knowledge this species has been reported from the Gulf States only. This is an interesting extension of range.

4. Family TUBERCULARIACEAE

204. *Strumella coryneoidea* Sacc. & Wint.

On dead twigs of *Quercus Garyana*, on the lower part of Mary's Peak Trail, Benton County. October. Rare. No. 2009.

It was surprising to find this species ranging so far west since it is a native of the northeastern part of North America. Only a very small amount of the *sporodochial* material was found. I do not believe the disease is at all serious in Oregon for further extended search for it has been fruitless.

OREGON AGRICULTURAL COLLEGE,
CORVALLIS, OREGON.

DARK-SPORED AGARICS—III

Agaricus

WILLIAM A. MURRILL

In my last article *Gomphidius* and *Stropharia* were discussed. The genus *Agaricus*, as at present limited, differs from them both in having free lamellae.

AGARICUS L. Sp. Pl. 1171. 1753

Pratella S. F. Gray, Nat. Arr. Brit. Pl. 1: 626. 1821.
Psalliota Quél. Champ. Jura Vosg. 107. 1872.

This genus, distinguished among brown-spored gill-fungi by a fleshy stipe, free lamellae, and the presence of an annulus, has received much attention because of the important edible species in it. The different species are usually not very well characterized, being much the same in shape and color and differing very little in spore characters. A number of new ones have been described from tropical America and from the Pacific coast. See MYCOLOGIA for March, 1918, and for November, 1912.

Pileus white or yellowish or becoming so; tinged with lilac in *A. comtulus* and sometimes with rose in *A. comtulus*.
  Pileus 2–5 cm. broad.
    Pileus white, becoming yellowish.
      Stipe 4 mm. thick. — 1. *A. comtulus*.
      Stipe 10 mm. thick. — 2. *A. alabamensis*.
    Pileus yellow, becoming nearly white. — 3. *A. comtuliformis*.
  Pileus larger, usually 5–15 cm. broad.
    Pileus white, unchanging
      Surface squamose. — 4. *A. solidipes*.
      Surface deeply rimose areolate. — 5. *A. praerimosus*.
      Surface smooth, glabrous or fibrillose.
        Pileus 7–12 cm. broad. — 6. *A. pilosporus*
        Pileus usually 5–7 cm. broad.
          Annulus cup-like — 7. *A. chlamydopus*.
          Annulus not cup-like. — 8. *A. campester*.
    Pileus white, becoming yellowish; or tinged with yellow at the center.
      Pileus lilac-tinted when young, yellowish when older. — 9. *A. variabilis*.
      Pileus yellowish at the center.
        Pileus 5–10 cm. broad. — 10. *A. Rodmani*.

Pileus 10–15 cm. broad. 11. *A. floridanus.*
Pileus becoming yellowish.
Spores 4–5 μ long. 12. *A. cretacellus.*
Spores 5–7 μ long.
Spores very broadly ellipsoid, about 7 x 5.5 μ. 13. *A. pratensis.*
Spores 5–7 x 3–4 μ. 14. *A. sylvicola.*
Pileus some shade of gray, brown, or reddish-brown, at least on the disk or with age.
Pileus glabrous or fibrillose; sometimes slightly squamulose in *A. brunnescens* and *A. micromegethus.*
Pileus about 2–5 cm. broad.
Stipe 1–2.5 cm. long; context not changing color when cut. 15. *A. micromegethus.*
Stipe 2.5–4 cm. long; context becoming blackish when cut. 16. *A. argenteus.*
Stipe 5–10 cm. long; context becoming reddish when cut. 17. *A. rutilescens.*
Pileus 5–20 cm. broad.
Stipe 2.5–5 cm. long.
Context whitish, unchanging. 18. *A. brunnescens.*
Context whitish, quickly reddening when cut. 19. *A. halophilus.*
Stipe 10–15 cm. long. 20. *A. magnicefs.*
Pileus distinctly squamulose or echinate.
Pileus 1–4 cm. broad.
Pileus echinate. 21. *A. echinatus.*
Pileus squamulose.
Species growing in leaf-mold in woods. 22. *A. diminutivus.*
Species growing on manure in the open; pileus usually quite umbonate. 23. *A. approximans.*
Pileus 5–18 cm. broad.
Context becoming distinctly reddish when wounded.
Stipe 8–12 mm. thick. 24. *A. haemorrhoidarius.*
Stipe 4–8 mm. thick.
Pileus becoming reddish-brown when bruised or on drying. 25. *A. subbrunnescens.*
Pileus not changing as above. 26. *A. chalcus.*
Context not becoming distinctly reddish when wounded.
Stipe 2–6 cm. long.
Pileus with scattered fibrillose scales. 8. *A. campester.*
Pileus with spot-like scales at the center. 27. *A. Sterlingii.*
Stipe 6–15 cm. long.
Stipe 4–8 mm. thick. 28. *A. placomyces.*
Stipe 1–1.5 mm. thick.
Annulus simple; hymenophores crowded. 29. *A. sylvaticus.*
Annulus double; hymenophores cespitose. 30. *A. subrufescens.*

1. AGARICUS COMTULUS Fries, Epicr. Myc. 215. 1838

Pileus subfleshy, campanulate to plane, 2–3 cm. broad; surface dry, appressed-silky or glabrous, white with a yellowish or rosy tint, becoming yellow on drying or when bruised, often darker at the center and with age; context thin, white, tinged with yellow, with mild taste and no characteristic odor; lamellae free, crowded, broad in front, pale-pink to purplish-brown; spores broadly ellipsoid, almost subglobose, very rounded at the ends, pale-purplish-brown under the microscope, about 4.5 x 3.5 μ; stipe tapering upward, hollow, whitish, luteous at the base, becoming yellow on drying or when bruised, 3–6 cm. long, about 4 mm. thick; annulus delicate, yellowish-white, often fugacious.

TYPE LOCALITY: Europe.

HABITAT: On the ground in open woods or in rich, grassy places.

DISTRIBUTION: New England to Alabama and west to Michigan; also in Europe.

ILLUSTRATIONS: Atk. Stud. Am. Fungi, *f. 21;* Cooke, Brit. Fungi, *pl. 533* (552); Fries, Ic. Hymen. *pl. 130, f. 1;* Richon & Roze, Atl. Champ. *pl. 18, f. 10–13.*

Specimens so named at Albany from Delmar and Menands seem to agree perfectly with material from Bresadola. Kauffman finds it rare in Michigan and says it needs more study. I have studied fresh specimens found here in the hemlock grove and Miss Eaton has drawn them in color.

2. **Agaricus alabamensis** sp. nov.

Pileus convex, cespitose, 3–5 cm. broad; surface smooth, of compacted fibrils, white, yellowish on drying, entire on the margin, the pellicle exceeding the lamellae by 2 mm.; context dry and spongy, white, with a distinctly sweetish taste and no odor; lamellae free, densely crowded, rather straight and narrow, cream-white to pink, then changing to brown; spores broadly ellipsoid, rounded at the ends, occasionally obliquely apiculate at the base, dark-purplish-brown under the microscope, 5.5–6.5 x 4–5 μ; stipe slightly tapering upward, solid, smooth, of compacted fibrils, white, yellowish on drying, 6–8 cm. long, 1 cm. thick; veil thick, white; annulus heavy, distant about 1.5 cm. from the pileus.

TYPE LOCALITY: Auburn, Alabama.

HABITAT: In clay soil in a plowed field.

DISTRIBUTION: Known only from the type locality.

Collected by F. S. Earle on May 19, 1901. The entire hymenophore is white and practically glabrous. The stipe is much longer than that of *A. campester* and the spores are quite different.

3. **Agaricus comtuliformis** sp. nov.

Pileus thin, slightly convex, at length expanded, 2.5–5 cm. broad; surface at first bright-yellow, nearly white at maturity, but with yellowish or brownish stains, especially near the center; margin becoming light-brown with age; lamellae free, narrow, crowded, cream-white, changing to light-pinkish-lilac, at length purplish-brown; spores broadly ellipsoid, smooth, sometimes obliquely apiculate at the base, dark-purplish-brown under the microscope, about 5 x 3.5 μ; stipe slender, not bulbous but tapering slightly upward, stringy or finally hollow within, nearly white but usually somewhat tawny and with more or less fibrous scales below the annulus, 5–7.5 cm. long, about 6 mm. thick; annulus fibrous and tomentose below, usually yellowish.

TYPE LOCALITY: Auburn, Alabama.

HABITAT: On the ground in pine woods.

DISTRIBUTION: Known only from the type locality.

Collected in quantity by F. S. Earle on July 29, 1899, and again on August 2 of the same year. It is larger than *A. comtulus*, with larger and darker spores, and the mature gills are darker. The surface of the pileus is bright-yellow in young, fresh plants, although much resembling that of *A. comtulus* in herbarium material.

4. AGARICUS SOLIDIPES Peck, Bull. Torrey Club 31: 180. 1904

Pileus fleshy, firm, convex, 2–7 cm. broad; surface squamose or rimose-squamose, white or whitish, involute on the margin; context white, unchangeable, edible, with an agreeable, sweet taste; lamellae crowded, free, dull-pink changing to dull-sepia, finally brownish-black; spores ellipsoid, 8–10 x 5–6 μ; stipe very short, equal or tapering upward and downward, glabrous, solid, white or whitish, with a slight, white veil often adhering entirely to the margin of the pileus, 2–4 cm. long, 6–10 mm. thick.

TYPE LOCALITY: Denver, Colorado.

HABITAT: In prairie pastures.

DISTRIBUTION: Vicinity of Denver.

Type collected by E. B. Sterling in June, 1902. Plants bearing this name at Albany, collected by C. F. Baker at Claremont, California, in 1900, are quite different from Sterling's plants.

5. AGARICUS PRAERIMOSUS Peck, Bull. N. Y. State Mus. 94: 30. 1905

Agaricus tabularis Peck, Bull. Torrey Club **25**: 325. 1898; not *A. tabularis* Fries, 1821.

Pileus very thick, fleshy, firm, convex, 5–10 cm. broad; surface deeply rimose-areolate, whitish, the areoles pyramidal, truncate, their sides horizontally striate and their apices sometimes tomentose; context whitish, tinged with yellow; lamellae narrow, crowded, free, blackish-brown when mature; spores broadly ellipsoid, generally containing a single large nucleus, 7.5–9 x 6–7.5 μ; stipe short, thick, solid, 2.5–5 cm. long, 1.5–2.5 cm. thick.

TYPE LOCALITY: Craig, Colorado.

HABITAT: In clay soil or dumps by roadsides.

DISTRIBUTION: Colorado.

Type collected by E. Bethel in August; also collected on dumps, etc., about Leadville by E. B. Sterling on September 18, 1901. The deep clefts in the pileus are probably caused to some extent by the dry air, as I have found them in other fleshy species from Colorado.

6. AGARICUS PILOSPORUS Peck, Bull. N. Y. State Mus. 94: 36. 1905

Agaricus sphaerosporus Peck, Bull. Torrey Club **31**: 181. 1904; not *A. sphaerosporus* Krombh. 1836.

Pileus fleshy, firm, broadly convex, sometimes slightly depressed in the center, 7–12 cm. broad; surface glabrous, whitish, the cuticle sometimes rimose, and the incurved young margin occasionally wavy or irregular when mature; context white, unchanging; lamellae thin, crowded, rounded behind, reaching the stipe, but free from it, rosy-red, becoming blackish-brown; spores globose or nearly so, 7.5–8 x 6–7.5 μ; stipe nearly equal, thick, firm, solid, straight or curved, whitish, 3–10 cm. long, 2–3 cm. thick, with a thin, white veil rupturing and adhering partly to the margin of the pileus and partly to the stipe, forming a slight, fringed, soon evanescent annulus.

TYPE LOCALITY: Denver, Colorado.

HABITAT: In rich soil.

DISTRIBUTION: Vicinity of Denver, Colorado.

Collected by E. B. Sterling on June 7, 1902. The types at Albany are in excellent condition.

7. AGARICUS CHLAMYDOPUS Peck, Bull. N. Y. State Mus. 94: 36. 1905

Agaricus cothurnatus Peck, Bull. Torrey Club 31: 181. 1904; not *A. cothurnatus* Fries, 1838.

Pileus fleshy, convex, with an involute margin, 5–7.5 cm. broad; surface dry, glabrous or minutely pulverulent on the margin, chalky-white; context white; lamellae crowded, free, chocolate-colored becoming black; spores subglobose, 8–9 x 7–8 μ; stipe nearly equal, white, with dense root-like fibers at the base, sheathed below by the white veil, which forms a cup-like annulus with its upper margin lacerate, 3–5 cm. long, 10–12 mm. thick.

TYPE LOCALITY: Denver, Colorado.

HABITAT: In rich soil along roadsides and paths.

DISTRIBUTION: Known only from the type locality.

Type collected by E. B. Sterling on July 25, 1902. The dried plants still retain their chalky whiteness.

8. AGARICUS CAMPESTER L. Sp. Pl. 1173. 1753

Pileus convex to expanded, 5–9 cm. broad; surface dry, silky and whitish, or floccose-squamulose and light-reddish-brown, the color being chiefly in the scales; context white, thick, solid, of mild flavor, usually not changing color when bruised; lamellae free, rounded behind, ventricose, crowded, pale-pink when young, becoming salmon-pink, and finally brown or blackish; spores ellipsoid, smooth, pale-purplish-brown under the microscope, blackish-brown in mass, about 7 x 4 μ; stipe smooth, white, cylindric, nearly equal, stuffed within, 3–6 cm. long, 1–1.5 cm. thick; annulus above or near the middle of the stipe, simple, white, often evanescent.

TYPE LOCALITY: Europe.

HABITAT: Wild in meadows and rich pastures; cultivated in caves, mines, houses, etc.

DISTRIBUTION: Cosmopolitan.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. 48: *pl. 6;* Atk. Stud. Am. Fungi, *f. 1–8;* Barla, Champ. Nice, *pl. 27;* Bull. Herb. Fr. *pl. 131;* Cooke, Brit. Fungi, *pl. 526* (544); Fries, Sv. Aetl. Svamp. *pl. 5;* Gibson, Edible Toadst. *pl. 5, 6;* Gill. Champ. Fr.

pl. 129 (572, 573); Hard, Mushr. *f. 248, 249;* Hussey, Ill. Brit. Myc. 1: *pl. 90;* McIlv. Am. Fungi, *pl. 91, f. 4, 5;* Murrill, Ed. Pois. Mushr. *f. 11;* Mycologia 1: *pl. 3, f. 1; pl. 15, f. 4;* N. Marsh. Mushr. Book, *pl. 18, f. 1;* Palmer, Mushr. Am. *pl. 1;* Richon & Roze, Atl. Champ. *pl. 14, f. 1–15;* Ricken, Blätterp. Deutschl. *pl. 61, f. 6;* Sow. Engl. Fungi, *pl. 305.*

I have found the common edible mushroom wherever I have traveled, whether in northern or southern Europe, tropical America, or on the Pacific coast. About New York City it usually appears in late summer and early autumn. There are many varieties, which need not be discussed here. The literature of the species is extensive.

9. AGARICUS VARIABILIS Peck in McIlv. Am. Fungi 346. 1900; not *A. variabilis* Batsch, 1783

Pileus ovoid to campanulate, becoming irregularly convex or nearly plane, subumbonate, densely cespitose, 10–15 cm. broad; surface smooth, minutely fibrillose or slightly floccose, pure-white, tinged with lilac in young plants and with yellow when older; margin not striate, but sometimes split; context very thin toward the margin, white, unchanging, with a strong almond-like taste and a slight odor of musk, edible, never attacked by larvae; lamellae free, crowded, ventricose, rather narrow, pure-white when young, becoming dark-umbrinous, without the usual purplish tint; spores dark-umber-brown, without a shade of purple; stipe equal, not bulbous, white, silky, smooth above the annulus, minutely scurfy below, 5–8 cm. long, nearly 1 cm. thick; annulus ample, white, mottled with yellow scales on the under side, persistent, fixed above the middle of the stipe.

TYPE LOCALITY: Mt. Gretna, Pennsylvania.

HABITAT: In an old roofless stable.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: McIlv. Am. Fungi, *pl. 91, f. 1.*

According to McIlvaine, who discovered the species, it grew in large quantities in an old stable from September until after frost. I have not seen the types. It is said to differ from *A. subrufescens* in being snow-white when young and tinged with light-lilac rather than with reddish-brown. If it is really a good species, a new name must be found for it.

10. AGARICUS RODMANI Peck, Ann. Rep. N. Y. State Mus. 36: 45. 1884

Pileus rather thick, firm, at first convex, then nearly or quite plane, 5–10 cm. broad; surface smooth or rarely slightly rimose-squamose on the disk, white or whitish, becoming yellowish or subochraceous on the disk; context white, unchanging; lamellae crowded, narrow, rounded behind, free, reaching nearly or quite to the stipe, at first whitish, then pink or reddish-pink, finally blackish-brown; spores broadly ellipsoid or subglobose, generally uninucleate, 5–6 x 4–5 μ; stipe short, subequal, solid, whitish, smooth below the annulus, often furfuraceous or slightly mealy-squamulose above, 5–7.5 cm. long, 12–25 mm. thick; annulus variable, thick or thin, entire or lacerate, attached at or below the middle of the stipe, often appearing double with the margins projecting above and below a central groove.

TYPE LOCALITY: Astoria, Long Island, New York.

HABITAT: In grassy ground and paved gutters.

DISTRIBUTION: Canada to Virginia and west to Michigan.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. 48: *pl. 9, f. 1–6;* Atk. Stud. Am. Fungi, *f. 17;* Hard. Mushr. *f. 250;* Kauffm. Agar. Mich. *pl. 45;* N. Marsh. Mushr. Book, *pl. 19.*

Named for Rev. Washington Rodman, who collected the types on Long Island. Specimens are to be seen at Albany also from Macoun, Wells, Wilson, Mackintosh, and Braendle. I have found it more than once about New York City. Dr. Kauffman reports it as frequent in Michigan, especially in cities, growing solitary or in clusters which sometimes contain 50 or 100 individuals.

11. AGARICUS FLORIDANUS Peck, Bull. N. Y. State Mus. 150: 50. 1911

Pileus hemispheric or campanulate, becoming nearly plane, solitary or subcespitose, 9–15 cm. broad; surface rimosely areolate or slightly strigose, becoming glabrous, whitish with a yellow or yellowish center; lamellae at first white, then pink, and finally dark-brown or blackish; spores globose or broadly ellipsoid, 5–6 x 4–5 μ; stipe easily separable from the pileus, equal or slightly thickened at the base, solid, becoming fibrous when old, whitish, 5–10 cm. long, 1.5–3 cm. thick; annulus small.

TYPE LOCALITY: DeFuniak Springs, Florida.

HABITAT: In sandy soil among grass in fields.

DISTRIBUTION: Known only from the type locality.

A number of specimens, preserved at Albany as the types, were collected by Dr. G. Clyde Fisher on March 29, 1910.

12. AGARICUS CRETACELLUS Atk. Jour. Myc. 8: 110. 1902

Pileus thin, convex to expanded, gregarious or sometimes a few joined at the base, 4–7 cm. broad; surface smooth, slightly viscid in wet weather, white with a yellowish tint at times; context white, or rarely with a pink tint, with odor and taste of almonds; lamellae narrow, free, narrowed behind, white at first, then pink, later becoming grayish-brown, not becoming black; spores 4–5 x 3 μ; stipe tapering from the enlarged base, white, smooth above the annulus, chalky-white below and covered with minute, white, powdery scales often arranged in irregular concentric rings below, solid, with the center less dense, 5–8 cm. long, 6–10 mm. thick; annulus persistent, white, smooth above, the lower surface with very fine floccose scales similar to those on the stipe from which the annulus is separated.

TYPE LOCALITY: Ithaca, New York.

HABITAT: On leaf-mold in woods.

DISTRIBUTION: New York and Michigan.

Kauffman says it is infrequent in Michigan in early autumn, growing gregariously on leaf-mold in coniferous regions.

13. AGARICUS PRATENSIS Scop. Fl. Carn. ed. 2. 2: 419. 1772

Agaricus arvensis Schaeff. Fung. Bavar. Ind. 73. 1774.

Pileus convex to expanded, 6–15 cm. broad; surface dry, subshining, glabrous or decorated with small fibrillose scales, white, becoming yellowish with age or on drying; context white, becoming yellowish, thick, highly flavored and easily digested, with an agreeable odor; lamellae free, crowded, broad, at first pallid, becoming slowly grayish-pink, and finally blackish-brown; spores very broadly ellipsoid, smooth, pale-purplish-brown under the microscope, blackish-brown in mass, about 7 x 5.5 μ; stipe glabrous, stuffed or hollow, white, becoming yellowish when bruised, often enlarged at the base, 5–10 cm. long, 8–16 mm. thick; annulus of two parts, membranous and white above, radiately split and tinged with yellow below.

TYPE LOCALITY: Bavaria.

HABITAT: In rich soil in pastures, fields, and wood borders.

DISTRIBUTION: Eastern North America; Bermuda and Mexico; also in Europe.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. **48**: *pl. 8;* Cooke, Brit. Fungi, *pl. 523 (540)*; Fries, Sv. Aetl. Svamp. *pl. 4;* Gill. Champ. Fr. *pl. 129 (571)*; Hard, Mushr. *f. 252, 253;* Hussey, Ill. Brit. Myc. **1**: *pl. 76, 77;* Lucand, Champ. Fr. *pl. 162;* Murrill, Ed. Pois. Mushr. *f. 27;* Mycologia **6**: *pl. 137, f. 2;* Richon & Roze, Atl. Champ. *pl. 10, f. 1–5;* Ricken, Blätterp. Deutschl. *pl. 62, f. 2;* Schaeff. Fung. Bavar. *pl. 310, 311;* Sow. Engl. Fungi, *pl. 304.*

14. AGARICUS SYLVICOLA Sacc. Syll. Fung. **5**: 998. 1887

Agaricus campestris sylvicola Vitt. Descr. Funghi Mang. 43. 1832.

Agaricus bulbosus McClatchie, Proc. S. Cal. Acad. Sci. **1**: 382. 1897.

Agaricus abruptus Peck, Mem. N. Y. State Mus. **3**: 163. 1901; not *A. abruptus* Fries, 1852.

Agaricus abruptibulbus Peck, Bull. N. Y. State Mus. 94: 36. 1905.

Pileus convex or expanded, 5–15 cm. broad, all parts of the plant except the lamellae being white at first and becoming tinged with straw-color in places with age or when bruised, or almost entirely on drying; surface smooth, shining, glabrous or slightly silky; context white, with agreeable odor and taste; lamellae thin, crowded, rounded behind, free, pale reddish-gray when young, becoming darker with age, and finally brown or blackish-brown with a chestnut tint; spores ellipsoid, purplish-brown, 5–7 × 3–4 μ; stipe long, equal, smooth, stuffed or hollow, bulbous, white, 8–20 cm. long, 6–15 mm. thick; veil usually double, forming a thin, membranous annulus decorated with floccose patches below.

TYPE LOCALITY: Italy.

HABITAT: In rich soil or humus in open woods and wood borders.

DISTRIBUTION: Temperate North America and Europe.

ILLUSTRATIONS: Atk. Stud. Am. Fungi, *f. 19, 20;* Cooke, Brit. Fungi, *pl. 520 (517)*; Gill. Champ. Fr. *pl. 129 (581)*; Hard, Mushr. *f. 251, 254;* Kauffm. Agar. Mich. *pl. 47;* Mycologia **6**: *pl. 139;* N. Marsh. Mushr. Book, *pl. 18, f. 2, & pl. 20;* Peck, Mem. N. Y. State Mus. **3**: *pl. 50, f. 1–14;* Richon & Roze, Atl. Champ. *pl. 12, f. 1–4.*

This attractive species is usually distinguished from *A. arvensis* by its smaller size and more slender shape. The abruptly bulbous stipe often seen in American specimens can hardly be considered a specific character; the same variation occurs in *A. subrufescens*, for example. There are many specimens at Albany from the eastern United States and I found it in several places on the Pacific coast, but never abundant.

15. AGARICUS MICROMEGETHUS Peck, Bull. N. Y. State Mus. 116: 44. 1907

Agaricus pusillus Peck, Ann. Rep. N. Y. State Mus. **54**: 152. 1901; not *A. pusillus* Schaeff. 1774.

Pileus fleshy but thin, convex, becoming plane, sometimes slightly depressed at the center, solitary or cespitose, 1–5 cm. broad; surface dry, silky-fibrillose or fibrillose-squamulose, grayish-brown, darker or brown on the disk, often with yellowish or ferruginous stains; context fragile, white or whitish, not changing color when wounded, with taste and odor of almonds; lamellae thin, crowded, free, grayish, soon pinkish, finally brown; spores broadly ellipsoid or subglobose, 5 x 4 μ; stipe equal or slightly tapering upward, sometimes bulbous, stuffed or hollow, slightly fibrillose, white, 1–2.5 cm. long, 2–6 mm. thick; annulus slight, often evanescent.

TYPE LOCALITY: Detroit, Michigan.

HABITAT: In various kinds of soil in shaded or exposed places.

DISTRIBUTION: New England to Tennessee, and west to Michigan and Texas.

ILLUSTRATION: Bull. N. Y. State Mus. 116: *pl. 107, f. 1–6.*

Type collected by Dr. R. H. Stevens. Other specimens are at Albany from Mackintosh, Morris, DeRouville, etc. I collected it on the Upper St. Regis; at Unaka Springs, Tennessee; and at Blacksburg, Virginia. There are specimens here also from New Jersey and Texas. The plant is not always *small*, but often about the size of the ordinary field mushroom. This is expressed in Peck's later name. Specimens from Delhi, New York, collected by Sherwood, are set aside by Peck as a variety.

16. AGARICUS ARGENTEUS Braendle in Peck, Bull. Torrey Club 26: 68. 1899

Pileus thin, convex, becoming nearly plane, 2.5–5 cm. broad; surface slightly silky or glabrous, pale-grayish-white or grayish-brown, shining with a silvery luster when dry; margin sometimes striate, at first incurved, often revolute with age; context edible, whitish, becoming blackish when cut; lamellae crowded, free, at first brownish, becoming blackish-brown or black with age; spores broadly ellipsoid, 7–10 x 6 μ; stipe short, glabrous, solid, often narrowed toward the base, 2.5–4 cm. long, 4–8 mm. thick; annulus slight, evanescent.

TYPE LOCALITY: Washington, District of Columbia.

HABITAT: Lawns and grassy places in rich soil.

DISTRIBUTION: Known only from the vicinity of Washington.

Collected by F. J. Braendle, who says that the drying specimens emit a strong but not unpleasant odor. The species appears after rains from April to November, and is often associated with *Stropharia bilamellata*.

17. AGARICUS RUTILESCENS Peck, Bull. Torrey Club 31: 180. 1904

Pileus fleshy, firm, convex with incurved margin, becoming nearly plane, 2.5–6 cm. broad; surface even or sometimes rimose and minutely fibrillose, dingy-white, becoming ferruginous, reddish-brown, or bay on drying; context whitish changing to reddish when cut or broken; lamellae crowded, narrow, free, reddish becoming blackish-brown; spores broadly ellipsoid, 7–8 x 5–6 μ; stipe equal or nearly so, firm, stuffed, silky, white, changing to reddish when wounded, frequently abruptly bulbous at the base, with a white veil often adhering partly to the margin of the pileus and partly to the stipe, 5–10 cm. long, 6–10 mm. thick.

TYPE LOCALITY: Denver, Colorado.

HABITAT: On manured ground in pastures.

DISTRIBUTION: Vicinity of Denver, Colorado.

Collected by E. B. Sterling on June 7, 1902. The types are well preserved at Albany.

18. AGARICUS BRUNNESCENS Peck, Bull. Torrey Club 27: 16. 1900

Pileus thick, firm, hemispheric, becoming convex or nearly plane, gregarious, 5–10 cm. broad; surface fibrillose, sometimes slightly

squamose, bay-brown or brownish; margin extending beyond the lamellae and appendiculate from the remains of the veil; context whitish or grayish-white, unchanging, with an agreeable taste, edible; lamellae crowded, rounded behind, free, but reaching the stipe, at first whitish, then reddish-pink, finally brown; spores broadly ellipsoid or subglobose, 6–8 x 4–6 μ; stipe short, silky, stuffed or hollow, whitish, then reddish, and finally brown, 2.5–4 cm. long, 6–16 mm. thick; annulus thick, of a soft, felty texture, persistent, whitish, often striate on the upper surface with impressions of the edges of the lamellae.

TYPE LOCALITY: East Cambridge, Massachusetts.

HABITAT: In dump ground on deposits of manure and street scrapings.

DISTRIBUTION: Vicinity of Cambridge, Massachusetts.

Several good specimens are at Albany, including the types collected by Miss Helen Noyes. See Peck's description for long and interesting notes. My *A. campester hortensis*, described and figured in MYCOLOGIA for July, 1914, seems very near this species. The spores are very broadly ellipsoid to subglobose, smooth, pale-purplish-brown under the microscope, about 7 x 5 μ; appearing broader and quite different from those of typical *A. campester*. The lamellae of my plant, also, are not so pink as those of the common mushroom.

19. AGARICUS HALOPHILUS Peck, Bull. N. Y. State Mus. 94: 36. 1905

Agaricus maritimus Peck, Bull. Torrey Club 26: 60. 1899; not *A. maritimus* Fries, 1818.

Pileus very fleshy, firm, at first subglobose, then broadly convex or nearly plane, 5–20 cm. broad; surface glabrous, sometimes slightly squamose with appressed spot-like scales, white becoming dingy or grayish-brown when old; context whitish, quickly reddening when cut, edible, with an agreeable taste and a distinct odor, suggestive of the odors of the seashore; lamellae narrow, crowded, free, pinkish becoming purplish-brown with age, white on the edges; spores broadly ellipsoid, purplish-brown, 7–8 x 5–6 μ; stipe short, stout, firm, solid, equal, sometimes bulbous, white, 2.5–5 cm. long, 1.5–2.5 cm. thick; annulus delicate, slight, and easily obliterated.

TYPE LOCALITY: Lynn, Massachusetts.

HABITAT: On sandy soil near salt water.

DISTRIBUTION: Massachusetts.

The type collected by Dr. R. F. Dearborn in November is well preserved at Albany. Dr. Dearborn also found specimens at Lynn, Nahant, and Marblehead from June to December. Peck has published interesting notes in connection with his description. Mr. Oscar Hill collected it at Revere, Massachusetts, on May 29.

20. AGARICUS MAGNICEPS Peck, Bull. N. Y. State Mus. 94: 36. 1905

Agaricus magnificus Peck, Bull. Torrey Club 26: 67. 1899; not *A. magnificus* Fries, 1838.

Pileus fleshy, thick, convex, becoming nearly plane or centrally depressed, gregarious or cespitose, 5–15 cm. broad; surface glabrous, often wavy and split on the margin, white or whitish, often brownish in the center; context 1.5–2 cm. thick in the center, thin on the margin, white, unchanging, edible, with taste and odor of anise; lamellae numerous, rather broad, crowded, free, ventricose, white becoming dark-purplish-brown with age, never pink; spores small, ellipsoid, 5–6 × 3–4 μ; stipe firm, stuffed with a cottony pith, bulbous or thickened at the base, fibrillose, striate, minutely furfuraceous toward the base, pallid or whitish, 10–15 cm. long, 2.5 cm. thick; annulus thin, persistent, white.

TYPE LOCALITY: Mount Gretna, Pennsylvania.

HABITAT: In thin woods.

DISTRIBUTION: Massachusetts, New Jersey, and Pennsylvania.

ILLUSTRATION: McIlv. Am. Fungi, *pl. 04*.

Collected by McIlvaine in August, 1898. The types at Albany are in rather bad condition because not properly dried before shipping. Sterling found it at Trenton, New Jersey, and Simon Davis in Massachusetts.

21. AGARICUS ECHINATUS Gunn. Fl. Norv. 2: 125. 1772

Pileus subfleshy, campanulate to expanded, gregarious or subcespitose, 1–3 cm. broad; surface dry, densely covered with minutely floccose to wart-like or pointed, fuliginous scales; context thin, white, becoming reddish; lamellae free, narrow, crowded, pink to dark-purplish-red or fuscous; spores ellipsoid, smooth,

dilute-ferruginous, with a purplish-brown tint under the microscope, hyaline when immature, reddish-purple-brown in mass, 4–5 x 2–3 μ; stipe equal, floccose-pulverulent and pale-fuliginous below, stuffed, white to blood-red within, 2–4 cm. long, 2–4 mm. thick; veil floccose, easily torn, forming an imperfect annulus.

TYPE LOCALITY: Norway.

HABITAT: In rich soil in greenhouses.

DISTRIBUTION: East Lansing, Michigan; also in Europe.

ILLUSTRATIONS: Ann. Sci. Nat. II. **5**: *pl. 13, f. 2* (as *Agaricus oxyosmus*); Cooke, Brit. Fungi, *pl. 395* (*122*) (as *Inocybe*); Gunn. Fl. Norv. **2**: *pl. 7, f. 6, 9, 10;* Pat. Tab. Fung. *f. 155* (as *Pholiota*); Ricken, Blätterp. Deutschl. *pl. 31, f. 6* (as *Inocybe*); Roth. Catal. Bot. **2**: *pl. 9, f. 1.*

I have authentic specimens from Europe of this very rare and interesting species reported by Dr. Kauffman as occurring in a greenhouse in East Lansing, Michigan. Saccardo places it in *Inocybe* and cites several synonyms. Patouillard classified it as a *Pholiota*. It very much resembles some species of *Lepiota* that turn red and have brown-tinted spores. Some of the figures also show a booted stipe, as in *Lepiota amianthina*.

22. AGARICUS DIMINUTIVUS Peck, Bull. Buffalo Soc. Nat. Sci. **1**: 53. 1873

Pileus thin, fragile, convex, becoming plane or centrally depressed, sometimes with a slight umbo, 2.5–4 cm. broad; surface dry, alutaceous, whitish, or pinkish-brown, adorned with small, appressed, silky, brownish scales, brownish or reddish-brown in the center; lamellae crowded, thin, free, ventricose, brownish-pink, becoming blackish-brown or black; spores ellipsoid, brown, 5 x 4 μ; stipe equal or slightly tapering upward, hollow or stuffed with a whitish pith, glabrous, whitish or pallid, 4–5 cm. long, 2–5 mm. thick; annulus thin, white, persistent.

TYPE LOCALITY: Croghan, New York.

HABITAT: Among fallen leaves or on mossy ground in woods.

DISTRIBUTION: Vermont, New York, and Michigan.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. **54**: *pl. 74, f. 1–8;* Kauffm. Agar. Mich. *pl. 50, f. 2.*

This species has been collected from a dozen or more localities in northern New York and Kauffman says it is frequent in Michi-

gan during August and September. I got a good collection on the Upper St. Regis and sent some of it to Albany. I also found a rather small specimen at Unaka Springs, Tennessee, which was isabelline with reddish-brown disk, and had a smooth, glabrous, white stipe which was cream-colored toward the base.

23. AGARICUS APPROXIMANS Peck, Bull. N. Y. State Mus. 131: 33. 1909

Pileus thin, conic or campanulate, often obtusely umbonate, gregarious or sometimes two united at the base, 2.5–4 cm. broad; surface squamulose except on the umbo, often radiately rimose, whitish, with brownish squamules, blackish-brown or fuscous on the umbo; context white, unchanging, with a sweet and agreeable taste; lamellae thin, crowded, free, white, becoming brown or blackish-brown; spores 5–6 × 3.5–4 μ; stipe equal or tapering upward, stuffed or hollow, whitish, sometimes brownish below the annulus, 2.5–4 cm. long, 4–6 mm. thick; annulus conspicuous, persistent, simple, white, attached above the middle of the stipe.

TYPE LOCALITY: Near Trenton, New Jersey.

HABITAT: On manure.

DISTRIBUTION: Known only from the type locality.

ILLUSTRATION: Bull. N. Y. State Mus. 131: *pl. V, f. 8–14.*

Collected by E. B. Sterling on September 5, 1908. The types, which are well preserved at Albany, remind me in their shape of some species of *Lepiota*.

24. AGARICUS HAEMORRHOIDARIUS Schulz. in Kalchb. Ic. Hymen. Hung. 29. 1874

Pileus fleshy, ovoid to expanded, solitary or somewhat clustered, 5–11 cm. broad; surface dry, covered especially toward the center with rather dense, appressed, fibrillose, brownish-gray squamules; context white, changing to blood-red when broken, the odor and taste agreeable; lamellae free, approximate, crowded, rosy-flesh-colored to purplish brown; spores ellipsoid, smooth, purplish-brown, about 6 × 4 μ; stipe subequal, fibrillose, pallid to somewhat darker with age, stuffed to hollow, solid at the base, which is sometimes bulbous, 5–10 cm. long, 8–15 mm. thick; annulus superior, ample, simple, persistent, white.

TYPE LOCALITY: Hungary.

HABITAT: About bases of trees in coniferous or mixed woods.

DISTRIBUTION: Temperate regions of North America, south to Virginia and west to California; also in Europe.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. **54**: *pl. 75, f. 1–13;* Cooke, Brit. Fungi, *pl. 531* (*550*); Gill. Champ. Fr. *pl. 129* (*577*); Kalchb. Ic. Hymen. Hung. *pl. 18, f. 1;* Richon & Roze, Atl. Champ. *pl. 16, f. 1-6.*

Peck called attention to this species in his 45th Report, his remarks being based on specimens collected under hemlocks at Menands, New York. It has since been reported from the United States in localities widely scattered. Kauffman found it infrequent in certain parts of Michigan, Harper got it in California, and I have it from Brooklyn, New York. It is easily recognized by its quick change to red when any part is bruised or broken in the fresh condition.

25. **Agaricus rubribrunnescens** sp. nov.

Pileus convex to expanded, rather thin, gregarious, reaching 8 cm. broad; surface dry, white, conspicuously ornamented from youth to maturity with slightly reddish scales, becoming reddish-brown when bruised or on drying; context thin, white, changing to reddish-brown; lamellae free, narrow, crowded, pink to dark-purplish-brown; spores ellipsoid, smooth, purplish-brown under the microscope, about 5.5 × 3.5 μ; stipe slender, equal or slightly enlarged at the base, slightly fibrillose, stuffed, white, becoming reddish-brown when handled or on drying, about 5 cm. long and 5 mm. thick; annulus simple, ample, persistent, white to slightly yellowish.

TYPE LOCALITY: Bronxwood Park, New York City.

HABITAT: About exposed roots of a living red maple tree on a lawn.

DISTRIBUTION: New York City and Long Island.

The type specimens were collected by me on September 8, 1910, in my yard, where the plant has appeared for several years. I have it also from two places on Long Island. It differs from *A. haemorrhoidarius* in its conspicuously scaly surface and smaller spores.

26. AGARICUS ELUDENS Peck, Bull. N. Y. State Mus. 139: 42. 1910

Pileus thin, ovoid, broadly conic or subcampanulate, sometimes broadly expanded, cespitose or solitary, 5–10 cm. broad; surface brown when young, becoming whitish and covered with brown, fibrillose squamules, smooth and brown on the disk; margin surpassing the lamellae when young; context white, changing to reddish when wounded; lamellae thin, crowded, narrow, free, whitish becoming bright-pink, then chocolate-brown and finally black or blackish-brown; spores subglobose or ellipsoid, 5–7 × 4–5 μ; stipe firm, nearly equal or sometimes thickened at the base, often slightly bulbous, fibrous, silky, white, distinctly hollow, white within, changing to blood-red when wounded, then to brown or black, 2.5–7 cm. long, 4–8 mm. thick; annulus thick, persistent, white, attached near the apex of the stipe.

TYPE LOCALITY: Near Trenton, New Jersey.

HABITAT: On dumping grounds.

DISTRIBUTION: Known only from the vicinity of Trenton.

ILLUSTRATION: Bull. N. Y. State Mus. 139: *pl. X, f. 6–13.*

The types were collected by E. B. Sterling on September 15, 1908, and he secured many more specimens on September 13, 1909. These are all at Albany. I see no difference between them and the type specimens of *A. placomyces*, which is known to become reddish-brown when bruised and to grow abundantly in the open at times.

27. AGARICUS STERLINGII Peck, Bull. Torrey Club 29: 73. 1902

Pileus fleshy, firm, convex or sometimes slightly depressed in the center, cespitose, 5–12 cm. broad; surface slightly silky and sometimes with appressed spot-like scales at the center, pale-brown or grayish-brown; context dingy, white or brownish, edible; lamellae thin, crowded, free, pale-brown, becoming blackish-brown with age; spores broadly ellipsoid, 6–8 × 4 μ; stipe equal or nearly so, solid or stuffed, 2.5 cm. long, 8–12 mm. thick, whitish, sometimes darker above the annulus, with a thick veil partly adhering to the margin of the pileus and partly to the stipe.

TYPE LOCALITY: New Jersey.

HABITAT: Unknown.

DISTRIBUTION: Known only from the type locality.

The type at Albany is marked "New Jersey, E. B. Sterling."

The specimens have ordinary garden loam attached to their clustered stipes. The species resembles *A. subrufescens* above, but the stipe is much shorter and thicker.

28. AGARICUS PLACOMYCES Peck, Ann. Rep. N. Y. State Mus. 29: 40. 1878

Pileus thin, at first convex, becoming flat with age, solitary, gregarious, subcespitose, or in rings, 5–8 cm. broad; surface dry, squamulose, whitish, becoming brown with age or when bruised, the disk and small scales blackish-brown; context rather thin, white or yellowish, without characteristic odor, edible; lamellae free, crowded, white, then pinkish, finally blackish-brown; spores ellipsoid or ovoid, smooth, purplish-brown under the microscope, 5–6 x 3.5–4 μ; stipe slender, smooth, containing a small pith, becoming hollow, slightly tapering upward, bulbous, white or whitish, becoming brown when bruised or on drying, 8–13 cm. long, 4–8 mm. thick; annulus large, flabby, floccose, double, persistent, fixed near the apex of the stipe.

TYPE LOCALITY: Oneida, New York.

HABITAT: On the ground in hemlock or mixed woods; sometimes in the open.

DISTRIBUTION: Temperate North America, south to Alabama and west to California.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. 48: *pl. 9, f. 7–12;* Atk. Stud. Am. Fungi, *f. 21–23;* Bull. U. S. Dept. Agr. 175: *pl. 25, f. 1;* Hard. Mushr. *f. 255–257;* McIlv. Am. Fungi, *pl. 91, f. 3.*

In addition to the type material from Oneida, Peck had many other specimens from New York, New England, Missouri, Minnesota, and elsewhere. I found it on the Pacific coast, but not in tropical regions. It is a very symmetrical and easily recognized species, found especially under hemlock trees.

29. AGARICUS SYLVATICUS Schaeff. Fung. Bavar. Ind. 62. 1774

Pileus campanulate to expanded, gregarious, 8–11 cm. broad; surface at first grayish, then yellowish-white, covered with brown scales, rufous-fuscous on the disk; context rather thick, with agreeable odor and taste; lamellae remote, crowded, rose-colored to reddish-cinnamon; spores ellipsoid, smooth, incarnate-fulvous, 6–7 x 3.5–4 μ; stipe equal or swollen at the base, glabrous or nearly so, whitish, hollow, 6–9 cm. long, 1–1.5 cm. thick; annulus simple, distant, ample, white, flocculose.

TYPE LOCALITY: Bavaria.

HABITAT: On the ground in woods.

DISTRIBUTION: Temperate North America, Canada to Alabama and west to California; also in Europe.

ILLUSTRATIONS: Bres. Fungi Trid. 1: *pl. 90;* Richon & Roze, Atl. Champ. *pl. 18, f. 6–9;* Schaeff. Fung. Bavar. *pl. 242.*

Peck recognized two color forms, one light and the other dark. He had specimens from Canada, Vermont, Illinois, etc., as well as from New York, but most of them appear to be different from plants collected by me in Sweden and other authentic material obtained from Bresadola. The typical plant is covered above with brown scales and does not change in color as does *A. haemorrhoidarius.*

30. AGARICUS SUBRUFESCENS Peck, Ann. Rep. N. Y. State Mus. 46: 25. 1893

Pileus at first deeply hemispheric, becoming convex or broadly expanded, cespitose, 5–18 cm. broad; surface silky-fibrillose, becoming conspicuously squamulose, whitish, grayish, or dull-reddish-brown, usually smooth and reddish-brown on the disk; margin not striate, often splitting with age; context white, unchanging, with the taste of green nuts and the odor of almonds when crushed; lamellae free, narrow, crowded, at first white or whitish, then pinkish, finally blackish-brown; spores ellipsoid, smooth, dark-purplish-brown under the microscope, 6–7.5 × 4–5 μ; stipe rather long, often somewhat thickened or bulbous at the base, at first stuffed, then hollow, white and subglabrous above the annulus, floccose-fibrillose to somewhat scaly toward the base, 6–15 cm. long, 1–1.5 cm. thick at the top, twice as thick below; annulus rather distant, very ample, reflexed, double, smooth and white above, ornamented with floccose, pale-tawny scales below.

TYPE LOCALITY: Glen Cove, Long Island, New York.

HABITAT: On leaf-mold in woods and on compost heaps consisting mainly of decaying leaves.

DISTRIBUTION: New York to Michigan and southward; also cultivated.

ILLUSTRATIONS: Ann. Rep. N. Y. State Mus. 48: *pl. 7;* Bull. U. S. Dept. Agr. 175: *pl. 36;* Kauffm. Agar. Mich. *pl. 48–50.*

This splendid species grows wild and is sometimes cultivated.

The type was collected by William Falconer. Peck had specimens also from northern New York, New Jersey, Michigan, and the District of Columbia. Dr. Kauffman has made a special study of it in Michigan and pronounces it the largest species of the genus in his state. When growing on compost, it naturally attains larger proportions than when growing wild in the woods. I have specimens from Long Island six inches broad; and I found a cluster in Tennessee under red cedars in a pasture composed of individual plants five inches broad and six inches high.

DOUBTFUL AND EXCLUDED SPECIES

Agaricus Achimenes Berk. & Curt. Ann. Mag. Nat. Hist. II. 1: 98. 1849. Described from South Carolina and also reported from North Carolina. I saw a portion of the type at Upsala, but did not make full notes on it; so I have asked Miss Wakefield to describe the specimens at Kew, which she has very kindly done as follows:

"There are three specimens of this. The largest, from which the spores drawn were taken, has a pileus measuring 9 cm. across. The other two are 4 and 5 cm. The pileus is slightly umbonate. The stalk varies from about 7 to 9 cm. in length. It is 5–8 mm. thick above, and becomes gradually thicker towards the base. A well-marked ring, with entire edge, occurs about one third of the distance from the apex. The base of the stem has some whitish mycelium adhering to it. The gills are very crowded, and appear to have been either free or adnexed. They are lightish brown in colour. Spores pale-yellowish by transmitted light, apiculate, 11–12 × 8 μ, and with a blunt apex such as one often sees in *Coprinus* spores, as if there were a regular germ-pore there. The plant is surely a *Pholiota*."

Agaricus amygdalinus M. A. Curt. Gard. Chron. 34: 1066. 1869. Curtis did not describe the plant, but said it could be recognized at once by its taste and odor of bitter almonds. According to him, it occurred commonly in North Carolina among leaves in rich woods, etc. See *A. fabaceus*. Other species of *Agaricus* are now known to have an almond flavor.

Agaricus cretaceus Fries, Syst. Myc. 1: 280. 1821; not *A. cretaceus* Bull. 1787. Described from plants found in manured fields in Sweden. Reported from North Carolina, Minnesota, and California by the older collectors. Peck mentioned it in his 22d Report, and there is a specimen in his collection from West Albany

so labeled, which does not entirely agree, however, with plants from Europe. Kauffman says the species differs from *A. cretacellus* Atk. in its "hollow stem, gills blackish-fuscous at maturity, and pileus at length scaly." I have an idea that it has been confused by some with *Lepiota naucina*.

Agaricus fabaceus Berk. Lond. Jour. Bot. 6: 314. 1847. Described from Waynesville, Ohio, growing among dead leaves in woods. Reported from South Carolina by Ravenel and from other localities by various collectors. Dr. Farlow suggested it might be the same as *A. amygdalinus* Curt. and *A. subrufescens* Peck. Miss Wakefield writes me from Kew as follows:

"The type from Lea, Ohio, consists of three specimens, in fairly good condition. The pileus is 10 cm. across in the largest, 5 cm. in the smallest, and umbonate. The stalk is somewhat swollen at the base, and 11 cm. long in the large specimen. Gills crowded, dark, either free or adnexed. No ring now present. Spores dark-brown by transmitted light, about 6–7 x 3.5–4 μ."

Agaricus flavescens (Gill.) Sacc. Syll. Fung. 5: 1000. 1887. Two collections so named at Albany are different and rather poorly preserved. *A. sylvicola* becomes yellowish with age or on drying and may have been confused by some American collectors with *A. flavescens*.

Agaricus foederatus Berk. & Mont. Syll. Crypt. 121. 1856. Described from plants collected in July in a pasture near Columbus, Ohio, by Sullivant. The description suggests a species of *Stropharia*, as Morgan has claimed. There is no specimen at Kew.

Agaricus xylogenus Mont. Syll. Crypt. 122. 1856. Described from plants collected near Columbus, Ohio, by Sullivant. See notes in *Mycologia* 6: 151. 1914, and in N. Am. Fl. 10: 64. 1914.

NEW YORK BOTANICAL GARDEN.

SOME CHARACTERS OF THE SOUTHERN TUCKAHOE

JOHN A. ELLIOTT

(WITH PLATES 17 AND 18)

The literature on *Pachyma cocos* is so abundant and covers so long a period that even a complete bibliography would take considerable space. Regardless of this fact, the fungus still remains a mycological mystery about which even the smallest additional information is likely to be of interest.

Although work had previously been done (5) toward establishing the purely fungoid nature of the tuckahoe, Prillieux (6) apparently deserves the credit of having first definitely stated that it was made up entirely of fungous elements. Fischer (4) carried the work considerably further in showing rather conclusively how the different types of tissues arose. The relation between the tuckahoe and the roots to which it was usually found attached has been variously explained. The early observers considered it entirely an outgrowth of the roots on which it was found. Berkeley (1) thought it an abnormal development of the root, induced, perhaps, by the action of a fungus. Fischer's conclusion that the tuckahoe is parasitic (4) in its nature has apparently not been questioned; but while there is no doubt that the fungus is destructive to woody tissues, from the information collected by Gore (5) it would seem that the fungus is a saprophyte, although it may be a facultative parasite as well.

The chemical nature of the tuckahoe was the first of its characters satisfactorily established. Torrey (7) reported the first analysis of the tuckahoe in 1821, stating that it was made up largely of a vegetable principle, which he called "sclerotin," and following Braconnet's (3) work on pectic acid, Torrey (8) identified his "sclerotin" as the pectic acid of Braconnet.

The generic relations of the tuckahoe have always been a matter of interest and speculation. There is little object in going into

history of the various guesses by those who had little or no knowledge of mycology. Gore's discussion (5) includes a report by W. H. Seaman on the botanical nature of tuckahoe, in which Seaman states that he would expect spores to develop from the dark mycelium directly beneath the cortical layer. Nothing, however, is suggested as to the possible generic relation of the fungus. Fischer (3), while he does not go into an exhaustive study of the possible generic relations, suggests, from analogy, that the tuckahoe probably gives rise to a polypore. Bommer (2) took up the study at the point Fischer left off and, after a comparative study of many sclerotia-forming fungi, suggested that *Pachyma cocos* may either be sterile or may be connected with the genus *Lentinus*.

Observations I have made on the tuckahoe have revealed some additional characters which may throw some light on the generic position and the habits of the fungus. Three different specimens have been sent to the Arkansas laboratory. The first was a small specimen with a smooth coat and showing no apparent connection with any foreign object. The other specimens were quite large and, according to the workmen who had dug them, were attached to sumac roots. They were of the rough-coated type generally described (Pl. 17, f. 1). One had been cut off of what was apparently a disintegrating root, the other had a living root slightly attached to one side by an overgrowing rhizomorph. The specimens were cut in halves and tissues from various parts examined microscopically by Prof. H. R. Rosen and myself. Our observations at this time revealed one point that so far as I have been able to ascertain has not been reported previously—*i.e.*, that the finer fungous threads quite commonly show the typical, clamp connections found in basidiomycetes (Fig. 1).

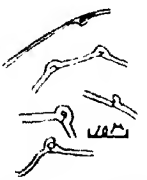


Fig. 1. Mycelium from *Pachyma cocos* showing clamp connections

With the purpose of inducing the sclerotium to produce a carpophore, one half of the larger specimen was placed on a glass surface under a bell jar and kept in the laboratory throughout the summer. No attention was given it beyond keeping it moist. The cut surface, which had been placed next to the glass, promptly produced a dark-brown, felty cortex which, as it aged, became more and more like the coat which covered the original surface (Pl. 17, f. 2, and pl. 18, f. 3). After this coat was formed, no change having been noted for several weeks, the sclerotium was placed in moist sand between some cotton plants on a greenhouse bench. It was again placed with the newly cut surface down. The only attention paid to the fungus during the winter was to uncover occasionally the upper half to discover any possible outgrowths. As in several months no change could be observed in the sclerotium aside from a slight yielding under pressure, it was dug out, upon which several interesting things were revealed. A rather large, black, root-like outgrowth had been put out from the lower surface of the sclerotium at the edge of the cut surface (Pl. 18, f. 4). This had spread out fan-wise as it reached the wood of the bench and spread over the surface of the wood for some distance. It seemed to be very securely attached to the pine-wood bench. Other strands had produced cylindrical sheaths covering two cotton roots which came in their way.

In detaching the fungus from the bench, the main rhizomorph was broken and several large drops of a milky fluid were exuded from the broken ends, principally from the one attached to the main sclerotium. This fluid was odorless and tasteless, as far as could be determined. One of the fungous sheaths surrounding the cotton roots was removed to observe, if possible, any effect on the root. Except for being a little brighter colored (supposedly because it was cleaner) than the parts of the root outside of the sheath, no effect on the root could be observed. The sclerotium was again placed in its position on the greenhouse bench, where, after several months, it was found that no further development had occurred, and that the rhizomorph had disintegrated (Pl. 18, f. 3). The sclerotium was again cut in two for examination. It had much the same appearance as when first found, except that it

was markedly less dense in structure, indicating a probable exhaustion of much of the stored food material. An attempt was made to culture the fungus from the interior of the mass by removing portions of the tissues aseptically and planting them on cornmeal agar. Plantings from the center of the mass failed to germinate, but a rapidly growing mycelium developed from sections cut from near the cortex. Cultures of this mycelium were transferred to flasks of cornmeal agar, where they quickly covered the surface of the agar with a dark-brown, thick, sterile, felty growth. It made no further development.

The exudation of milky juice from the broken rhizomorph suggested the presence of lactiferous ducts and glands in the sclerotium, and sections were accordingly cut from various parts of the structure, embedded in paraffin, sectioned, and stained for more detailed microscopic study of its morphology. In addition to the

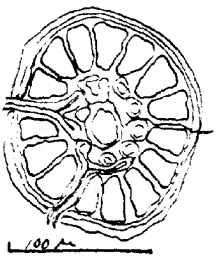


FIG. 2. Camera lucida drawing of a glandular body in *Pachyma cocos* showing entering ducts. This was one of the more regular forms.

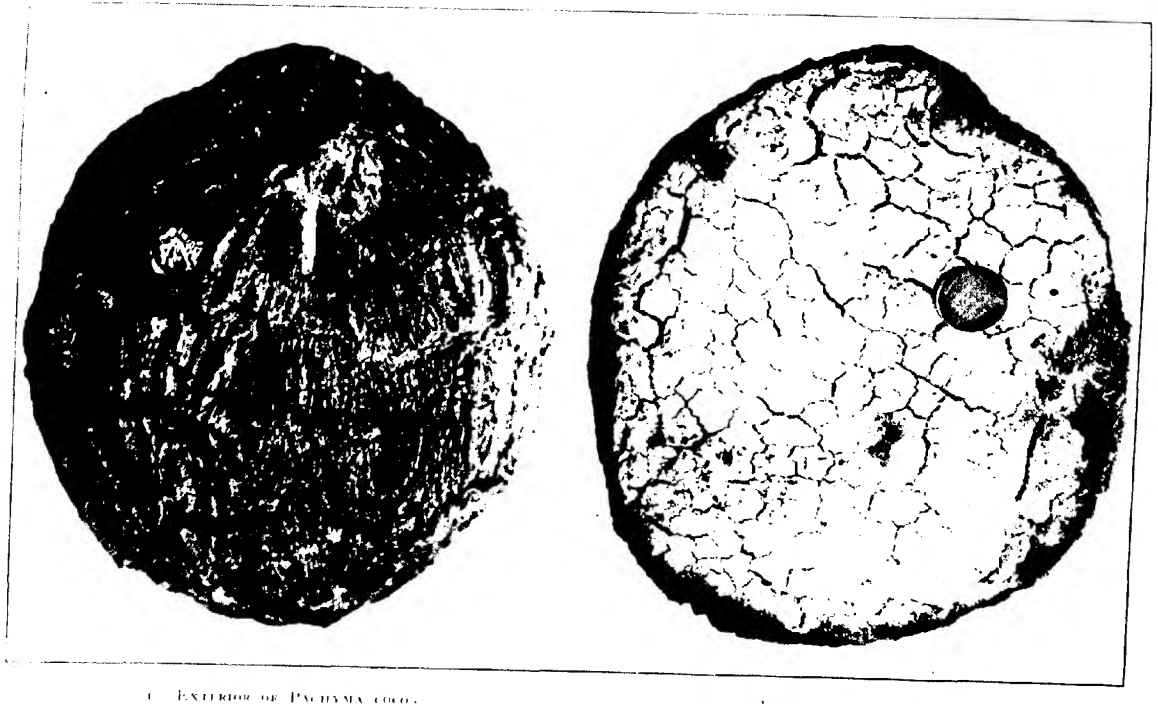
variously shaped fungous elements which have been reported by Prillieux, Fischer, Bommer, and others, structures were found which would seem to be lactiferous ducts and glands. These were near the cortex in all cases observed. The ducts were thin-walled; large (10 μ) in comparison to the hyphal threads (2–4 μ) and usually ended in structures which were interpreted as glands (Fig. 2). With Flemming's triple stain, the fungus took a uniform light-blue stain throughout. However, scattered along the inside of the supposedly lactal glands and ducts were granules and droplets which took the safranin stain quite consistently. These drop-

lets were interpreted as being the remains of the lactic fluid which the glands had secreted.

The detailed structure of these glandular bodies is rather difficult to make out and is different in different specimens. Two constant features are the presence of an outer wall of several layers which have the appearance of the striations of a starch grain and the presence inside the body of a number of "ducts" which can be seen to penetrate the wall and apparently ramify throughout the interior. The structure within the striated walls is quite variable. While most of the large elements in the tuckahoe are homogenous bodies with no apparent striations whatever, an occasional body may be found in sectioned material which is markedly striated. The bodies interpreted as glands may be these large striated bodies partly dissolved by the action of the ducts entering them. They do, however, differ considerably from most of the larger elements of the tuckahoe, in their regularity of form. In looking over a slide they may be very readily located by following the path of the ducts, which invariably lead in their direction.

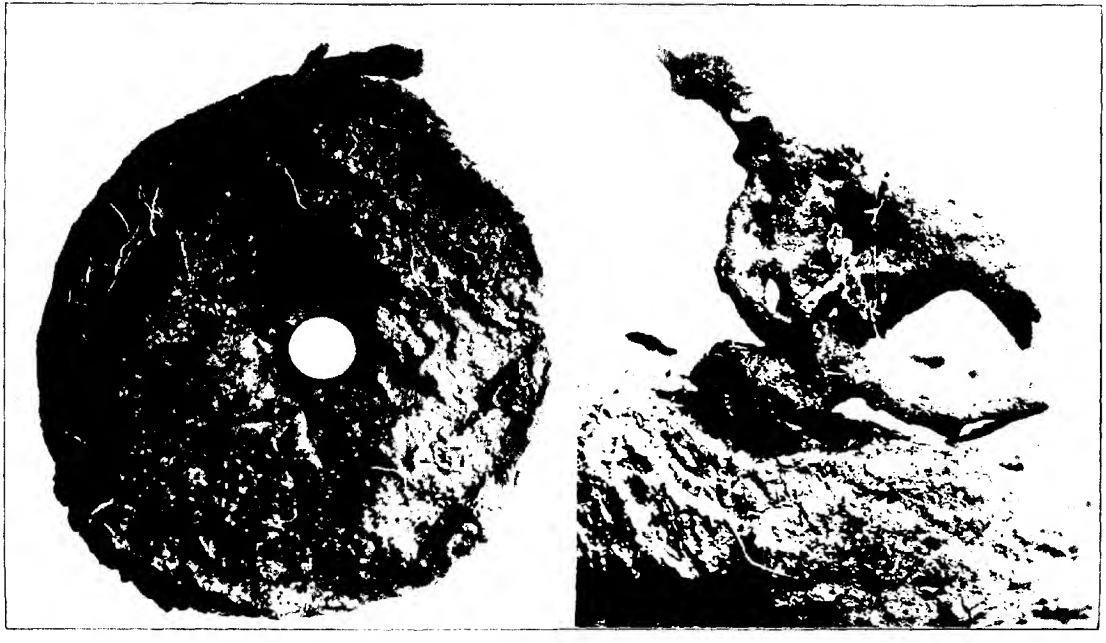
The presence of the milky juice and the lactiferous ducts and glandular bodies may be of some generic significance. However, it would seem essential, in a sclerotium of the size and nature of the southern tuckahoe, if the stored material is to be transported rapidly for the production of a fruiting body or any other purpose, that some system of glands and ducts be developed.

The behavior of the fungus in the greenhouse bench probably has no significance in determining its possible parasitism. The mycelium was apparently penetrating the pine boards in the bottom of the bench; also, it had overgrown two cotton plant roots without any apparent injury to them. Its failure to attack the cotton roots does not prove that the fungus can not attack living, pine roots, as has been so often affirmed. With suitable equipment, it should not be difficult to follow for a considerable period the development of the tuckahoe and its possible parasitic relation to various hosts. The idea, commonly prevalent among the earlier observers, that the whole sclerotium was covered with the bark of the root attacked, which idea led to the conclusion that the growth was an abnormally developed root, is easily understood. The cortex has much



1. Exterior of Pachyma cocos.

2. Interior of Pachyma cocos.



A. Showing [illegible]

B. Showing Rhizomorph

the appearance of the roughened bark of a large root, or, more nearly, of the bark of a tree trunk or branch, and for the same reason. A microscopic study of the cortex of the sclerotium may show little, if any, of the original wood or bark of the host, but the fungous cortex will be thicker and denser in some places than in others. The old cortex evidently stretches and cracks as the sclerotium enlarges, the newly developed cortex filling in the gaps between the older portions, making the surface rough and uneven.

The writer is much indebted to Mr. H. R. Rosen and Prof. E. A. Burt, of the St. Louis Botanical Garden, and Miss E. B. Hawks, of the United States Department of Agriculture Library, for references to literature, and especially to Mr. Rosen for his interest and assistance in the study.

ARKANSAS EXPERIMENT STATION,
FAYETTEVILLE, ARKANSAS.

LITERATURE CITED

1. **Berkeley, M. J.** Indian Bread or Tuckahoe. The Gardener's Chronicle. 829. 1848.
2. **Bommer, C.** Sclerotia et Cordons Mycéliens. 1894.
3. **Braconnet, H.** Recherches sur un nouvel acide universellement repandu dans tous les vegetaux. Annales de chimie et de physique. **25**: 358–373. 1824.
4. **Fischer, E.** Beitrage zur Kenntniss exotischer Pilze. Hedwigia. **2**: 61–126. 1891.
5. **Gore, J. H.** Tuckahoe, or Indian Bread. Smithsonian Report, 687–701. 1881.
6. **Prilleaux.** Le Pachyma Cocos en France. Bulletin de la societe botinique de France. **36**: 433. 1889.
7. **Torrey, J.** Analysis of the *Sclerotium giganteum* or Tuckahoe. The Medical Repository, new series. **6**: 37–44. 1821.
8. —— On the pectic acid of Braconnet, and its identity with Sclerotin, a peculiar principle existing in the Tuckahoe, or Indian Bread. (New York Medical and Physical Journal. **6**: 481–490. 1827.)

EXPLANATION OF PLATES 17 AND 18

Fig. 1. External view of *Pachyma cocos* Fries, showing roughened bark-like cortex.

Fig. 2. Cut surface of *Pachyma cocos* after drying about 24 hours. The homogenous character of the interior is evident. (The coin is a one-cent piece.)

Fig. 3. New cortex grown on cut surface of a tuckahoe (shown in Fig. 2), and remnant of rhizomorph shown in Fig. 4.

Fig. 4. Rhizomorph produced by a tuckahoe growing on a greenhouse bench. (This negative was scratched.)

CULTURES OF HETEROECIOUS RUSTS, 1920–21

W. P. Fraser

A few culture experiments made in 1920 and 1921 seem worth recording, as they extend the aecial host range of *Puccinia subnitens* Diet., the well-known pluriverous rust. They also clear up the confusion that has prevailed in regard to the connections of the aecia on *Glaux maritima* L.

Telial inoculations were made by suspending germinating telia above the potted host plants which had been sprayed with water by an atomizer. The plants were placed in an infection box for about 48 hours and then removed to the greenhouse. In every experiment several checks were kept which remained free from infection.

Puccinia Distichlidis Ellis & Ev.

Aecia were found to be locally abundant on *Glaux maritima* L. near Saskatoon in the spring of 1920. Field observations left little doubt that they were connected with *Puccinia Distichlidis* on *Spartina pectinata* Bosc. Telial material on this host was collected and gave excellent germination. Inoculations were made in the greenhouse on two pots of *Glaux maritima*. Pycnia developed on both, followed by abundant aecia. The experiments were repeated in 1921, on May 27, on two pots of *Glaux maritima*. Pycnia and aecia followed in abundance. Inoculations of a third pot on June 2 were also successful. Dr. Arthur studied the material from the field collections and cultures of 1920, and as a result has listed *Glaux maritima* as an aecial host of *P. Distichlidis*. (See N. A. F. 7: Part 4, 317.)

Arthur (Mycol. 8: 136. 1916; 9: 269. 1917) has shown that *Puccinia Distichlidis* on *Spartina Michauxiana* Hitchc. has aecia also on *Stieronema ciliatum* (L.) Raf. Field observations made at Brandon, Man., indicate that this is also true in western Canada. This culture adds another host species to that established by Arthur.

Plowright in 1890, using telial material of *Uromyces Scirpi* Burr. from *Scirpus maritimus* L. in England, successfully infected *Glaux maritima*. This work has not been confirmed in America, but American aecia in *Glaux* have been referred to that species. This experiment and the one described below shows that aecia on *Glaux* may belong to *P. Distichlidis* or *P. subnitens*.

UROMYCES ALOPECURI Seym.

Inoculations were made on a pot of *Alopecurus aristulatus* Michx. with aeciospores from aecia on *Ranunculus apetalus* Farr, collected by Mr. A. McNeil. Uredinia and telia followed. This confirms the results of cultures in 1918. (See Mycol. 11: 129. 1919.)

PUCCINIA SUBNITENS Diet.

Field observations near Saskatoon in 1920 indicated that aecia on *Glaux maritima* were connected with *Puccinia subnitens* or *Distichlis stricta* (Torr.) Rydb. Inoculations with germinating teliospores were made on two pots of *Glaux maritima* on June 26. Pycnia appeared in about a week, and were followed by abundant aecia. The experiments were repeated in 1921. Inoculations were made on different potted plants on May 27, June 2 and 9. Heavy infection followed in all the plants inoculated, both pycnia and aecia developing abundantly. Inoculations on *Dodecatheon pauciflorum* (Durand) Greene failed to produce infection.

Aecia from the cultures and field collections of 1920 were sent to Dr. Arthur, who was then preparing the manuscript of *North American Flora* covering the heteroecious grass rusts. He studied the field collections and the cultures of aecia and reported that they agreed in every respect with those of *P. subnitens*, and pointed out that the outer walls of the peridial cells were much thickened as in the typical aecia of *P. subnitens*. In this respect they differed markedly from the aecia on *Glaux* belonging to *P. Distichlidis*. He listed the field collections on *Glaux* from Saskatchewan under *P. subnitens* Diet. (*Dicaeoma Sarcobati* (Peck) Arth.). (See N. A. F. 7: Part 4, 305.)

The aecia of *P. subnitens* on *Glaux* were long and slender and differed in this respect from the aecia of *P. Distichlidis* on the

same host, which developed under exactly the same conditions in the greenhouse. The latter were short and cupulate and much paler in color. The field collections also showed the same differences.

Observations in 1920 and 1921 in the same region also indicated the connection of aecia on *Plantago eriopoda* Torr. with *Puccinia subnitens* on *Distichlis stricta* (Torr.) Rydb. Inoculations were made on three pots of *Plantago eriopoda* on May 27. Heavy pycnial infections appeared on all the plants, followed by aecia. The aecia showed the characters of *Puccinia subnitens*, the outer wall of the peridial cells being much thickened. The aecia were not so long as those of *P. subnitens* on *Glaux maritima* grown in the greenhouse at the same time and under the same conditions, nor was the production of aecia so abundant.

Many cultures by Arthur and by Bethel (Phytopath. **7**: 92. 1917; **9**: 193. 1919) have shown that *P. subnitens* is a species with a large number of aecial hosts in many families. Arthur, in the *North American Flora*, lists twenty-one families (including *Glaux maritima*). These experiments have added two new families to the list of aecial hosts. Arthur (Mycol. **9**: 306. 1917; Bot. Gaz. **25**: 17. 1903) has shown that *Uromyces seditiosus* on *Aristida* has aecia on several species of *Plantago*. These experiments show *P. subnitens* also has aecia on *Plantago eriopoda*.

SUMMARY OF NEW RESULTS

Puccinia Distichlidis Ellis & Ev. Inoculations with teliospores from *Spartina pectinata* Bosc. produced pycnia and aecia on *Glaux maritima* L.

Puccinia subnitens Diet. Inoculations with teliospores from *Distichlis stricta* (Torr.) Rydb. produced pycnia and aecia on *Glaux maritima* L. and *Plantago eriopoda* Torr., but failed to infect *Dodecatheon pauciflorum* (Durand) Greene.

SUMMARY OF RESULTS CONFIRMING PREVIOUS WORK

Uromyces Alopecuri Seym. Inoculations with teliospores from *Ranunculus apetalus* Farr infected *Alopecurus aristulatus* Michx.

DOMINION LABORATORY OF PLANT PATHOLOGY,
UNIVERSITY OF SASKATCHEWAN,
SASKATOON, SASK.

NOTES AND BRIEF ARTICLES

[Unsigned notes are by the editor]

Dr. A. H. W. Povah, recently connected with the Alabama Polytechnic Institute, has been appointed assistant professor of botany at Northwestern University.

Dr. Arthur S. Rhoads, formerly Assistant in Forest Pathology of the U. S. Bureau of Plant Industry, and more recently of the Office of Cereal Investigations and the Office of Fruit Disease Investigations of the same bureau, has resigned to accept the position of pathologist at the Missouri State Fruit Experiment Station at Mountain Grove, Missouri.

A list of smuts and rusts prepared by Mrs. Flora W. Patterson and her assistants has been issued as Department Circular 195 of the U. S. Department of Agriculture.

Septocladia dichotoma, a new genus and species of water-molds, was described and figured by Coker and Grant in the *Journal of the Elisha Mitchell Scientific Society* for March, 1922.

Two fine specimens of *Clavaria subcaespitosa* Peck, representing different stages of the plant, have been sent to the mycological herbarium by Miss Ann Hibbard, who collected them at Ellis, Massachusetts, the type locality, on August 23, 1921. In a letter accompanying the plants Miss Hibbard remarks: "The spores in these specimens are rough, but Dr. Burt, to whom I have also sent specimens, writes me that spores of the type specimen at Albany are rough, although Mr. Peck made no mention of that fact in his published description of the species."

The Imperial Bureau of Mycology has undertaken the publication of a monthly abstracting journal, the *Review of Applied Mycology*, for the purpose of supplying, month by month, a summary of the work published in all countries on the diseases of plants and various other aspects of economic mycology. The first number was issued in January, 1922, and a volume of between four and five hundred pages annually is expected. All communications respecting the publication should be sent to the Editor, Imperial Bureau of Mycology, Kew, Surrey.

In a recent article by Professor Bruce Fink under the heading of "An Addition to the Distribution of a Rare Fungus" (MYCOLOGIA, Vol. XIV, p. 49) it is noted that a collection of *Tylostoma verrucosum* made at Oxford, Ohio, in 1921 seemed to be a fourth locality for this fungus. Some twenty of these fine plants were found growing gregariously on very rich leaf-mold on the Indiana University campus, Monroe County, Indiana, October 2, 1911. This was published in the Indiana Academy of Science, 1911, p. 351.—*J. M. Van Hook.*

The spores of *Schizophyllum commune* are shown by J. F. Adams in *Torreya* for November–December, 1921, to be slightly pinkish in mass, and the suggestion is made that it belongs, therefore, in the Rhodosporae rather than in the Leucosporae. Several species belonging to *Pleurotus*, a white-spored genus, also have rosy-tinted spores. Nature does not always draw her lines as definitely as man would like. Mr. Adams's suggestion that *Schizophyllum* might be used by students for spore prints during the winter is an excellent one.

The Report of the New York State Botanist for 1919, distributed in February, 1922, contains a list of about 20 fungi new to the state; a description of the new species *Microdiplodia populi* Dearness from Colorado; an index to the New York species of *Mycosphaerella*, 47 in number; an article on new or noteworthy species of fungi, by Dearness and House; and studies in the genus *Inocybe*, by Kauffman, briefly noticed in the March number of

Mycologia. New species described by Dearness and House are: *Diaporthe menispermi, Diaporthe triostei, Didymella agrostidis, Gloeosporium acutiloba, Gnomoniopsis acerophila, Leptosphaeria collinsoniae, Leptothyrium conspicuum, Phomopsis impatientis, Ramularia eamesii, Saccardinula alni, Septoria acetosella, Septoria hieracicola, Stagonospora meliloti,* and *Venturia fimbriata.*

Volume 6, part 1, of *North American Flora* consists of a monograph of the genus *Phyllosticta* by Fred J. Seaver. The work is largely a compilation of the species described and reported for North America—*i.e.*, no attempt has been made to culture out the species in order to determine their life histories, although the gross morphology has been studied as carefully as the available material will permit. Wherever the perfect stage is known, it has been indicated in a note supplementary to the descriptions. In order to comply with the form, a key has been arranged. On account of the difficulty, however, of constructing a satisfactory key for such a large genus in which the specific differences are so slight, the general rule for *North American Flora* has been modified and a host index supplied for the genus. An attempt has been made to correct host determinations where material is adequate, but unfortunately many of the specimens are so fragmentary that it has been necessary to accept the host determinations made by the collector. The entire work consists of 84 pages of text and was issued early in April, 1922.

MACBRIDE'S NORTH AMERICAN SLIME-MOULDS[1]

Both student and nature lover will welcome the appearance of Professor Macbride's long-looked-for revision of the North American Slime-Moulds, for in spite of its obscurity this group of organisms is of like interest to both the professional botanist and the amateur. Standing as they do on the border line between animals and plants, or, as suggested by the author of the book, perhaps outside the pale of either, they furnish a most fertile field for the speculation of the student. Consisting, as they do in their

[1] Macbride, T. H. North American Slime-Moulds, pp. i–xvii, 1–299. The MacMillan Co., New York, 1922.

vegetative stage, of a naked mass of liquid protoplasm which, unlike all other liquids, defies the laws of gravity and persistently flows uphill instead of down, these organisms never cease to arouse the interest of the nature student, provided their eyes are keen enough to detect them at all or some one has directed their attention to them.

Add to this the varied and fantastic shapes which are assumed by the fruiting stage of the slime-moulds and which adorn the ugly surface of rotting logs with minute feathers and cushions of the most delicate structures and beautiful colors, and it is difficult to select any group of either animals or plants which can furnish a more fascinating subject for observation and study. Only one other thing is necessary to make this work a great success, and that is the personality of the man behind the book, which, while it may shine out through the printed page, can never be fully appreciated unless one, like the writer, has come into personal contact with its author in the classroom.

In matters of nomenclature the author has not followed hard and fast rules, but has apparently attempted to use the oldest recognizable specific names without regard to rule or date. He has attempted to correlate the work of America and Europe so that the species common to the two continents will appear under the same names in the standard American and European works, where the identity can be agreed upon. One other very commendable feature of the book is the extensive notes and observations which supplement the technical descriptions.

The illustrations consist of twenty-three plates as compared with eighteen in the old edition. The plates are made in half-tone from photographs and drawings showing habitat sketches and microscopic details. The drawings are very well done, the sculpturing of the spores and capillitium being so well shown that they can not fail to arouse in the reader a desire to see actually and know more of these wonderful organisms. No colored illustrations are used. A copy of this book should be in the hands of not only every botanist, but also of every nature student who loves to ramble in the woods and fields in search of natural objects of interest.

F. J. SEAVER